

Huge New York Show Crowds Spur Industry's Hopes for a Good Year

Early Attendance Indicates New Record May Be Set—Prices Up 10 to 15 Per Cent—Body Design Trends a Focal Point of Interest

by Don Blanchard

Editor, Automotive Industries

THE greatest opening day attendance in the history of the national automobile shows greeted the industry's premier exhibition of its 1934 models in Grand Central Palace, New York.

As C. F. Kettering said at the S.A.E. banquet, "The engineers have really done something this year," and increases in paid attendance of 112 per cent on Saturday and of 92 per cent on Monday over the corresponding days last year make it look as though the public agreed with him.

Optimism, spurred by the tremendous public interest, was the keynote of the Show. Nobody expects any miracles, but there was plenty of quiet confidence that the up-

swing inaugurated last year will continue through 1934. Guarded estimates of the year's output ranged from about 2,300,000 up, with the average guess probably being around 2,700,000. At the present time, production is gathering speed, although on some lines it will be late in February or early in March before deliveries start.

Price was a focal point of interest throughout the Show. On opening day no prices were available on fully half the cars on display, including such important lines as Auburn, Chrysler, DeSoto, Dodge, Graham, Hudson, Hupp, LaFayette and Plymouth. General Motors hung its price tags on as the Show opened. Pierce-Arrow

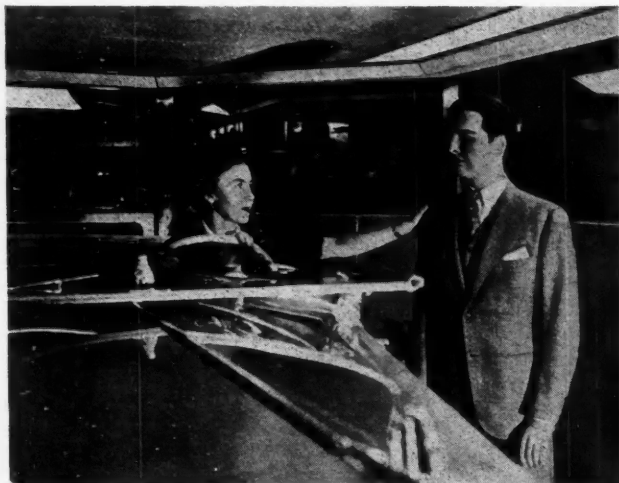
also revealed its prices at that time and, of course, Studebaker and Nash prices already had been announced. Chrysler broke the news on its four lines on Sunday and by Tuesday evening all the gaps had been filled in. Because of the lateness of so many price announcements, it is impossible as this is written to make any estimate of what public reaction to the generally higher prices is going to be.

The price problem facing the manufacturer was unusually difficult this year. Many of the producers had no production experience on their new jobs, as the nearly half-million dollars invested in hand-hammered bodies for show purposes gave evidence. The effect of rising costs and the uncertainties of volume were additional difficulties. Important as these elements were, however, there is little doubt that a major factor responsible for the late price announcements was the desire to see what the other fellow was going to do before making any commitments. There was no question that prices generally were going up; the question was how much.

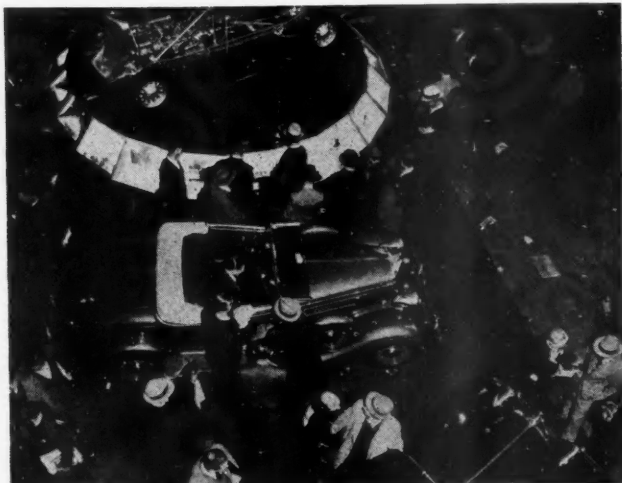
As the summary of price changes presented elsewhere in this issue indicates, the increases ranged from 10 to 15 per cent. In some cases these increases probably will be offset to an extent by reductions in the spread between list and delivered prices effected by reducing



A view of the crowd that milled in the aisles and thronged the exhibits on Saturday.



Plymouth's Acoustical Delusion—a soundproof room containing a car, a dummy and a lecturer. Listeners ranged around the outside heard what went on through 'phone receivers. They can be seen peering through the glass.



Dodge had a chassis mounted on a revolving circular turntable. Around its edge were ranged a large number of display cases, brightly illuminated and containing exhibits of new Dodge features, some of them being action displays.

dealer handling charges and accessory discounts. There was no widespread shifting of dealer discounts, but what there was had an adverse effect on the dealer's gross.

The new price schedules reflect some important shifts on the price ladder. The Olds six is now in the \$700 class (using four-door sedan as the criterion) and fits in the General Motors line between Chevrolet and Pontiac, the sedan price on the latter car now being \$785 against \$695 in 1933. The Hudson eight is now directly competitive with Pontiac, having moved down from the \$1,000 group. The Chrysler six has gone from \$785 to \$850, while Graham has edged into the \$600 group with a six at \$695. DeSoto has jumped from \$735 to \$995. Nash has the LaFayette at \$695 and the new Auburn six also lists at that figure.

The effects of the new price relationships among the three biggest

sellers will be watched closely by the whole industry. Here is the new line-up:

	New	Old	
Chevrolet Standard.	\$490	\$455	+\$40
Ford Standard. . . .	535	500	+ 35
Plymouth Standard.	535	465	+ 70
Ford De Luxe.	575	550	+ 25
Chevrolet Master ..	585	515	+ 70
Plymouth De Luxe.	595	525	+ 70

The prices in the foregoing table are for the two-door sedans in every case.

The subject of delivered prices, who is to determine them and how, was a matter of more than passing interest during the Show. Moves made by some factories, which cut the spread between list and delivered prices and also reduced the retail gross profit per unit, to put it mildly were not well received by dealers affected thereby. Such reductions in gross profit, of course, are offset to some extent by the higher list prices on which the dis-

counts will be figured this year.

The retail code states that dealers must not sell new cars for less than list price plus accessories at list plus taxes plus transportation plus handling, including unloading, assembling, conditioning and interest actually paid for not exceeding 90 days on transportation. The code does not say that the dealer cannot charge more than the figure arrived at in this manner. Whether the intent of the code was to set a minimum or to define what could and what could not be included in the delivered price, is something that NRA probably will have to settle. Meanwhile there is considerable confusion as to what may be charged for handling, whether advertising charges can be included in the delivered price or must be absorbed by the dealer, whether dealers may include a charge for periodic inspection service, etc. Another basic question demanding an answer is whether factories or dealers are to set delivered prices.

The whole question of fleet discounts also seems to be still up in the air. It appears to be agreed that dealers can't give such allowances under their code. And the problem of handling trade-ins complicates direct factory selling. The question is an important one, not only in the automobile field but in other fields, too, as hearings held in Washington this week on price rises indicate. At these hearings a big volume of complaints came from quantity buyers, who under some codes are no longer able to get preferential prices on their purchases.



The rear of the "Land Cruiser," Studebaker's new body style in the President chassis.

Although the labor situation is still a matter of concern, executives attending the Show seemed to be practically unanimous that the situation is much less critical than it was 60 days ago. Prevailing high wage rates have helped to bring this about. But of greater importance has been the more sympathetic understanding of each other's problems that has developed between men and management. There is, moreover, a general feeling that if differences do arise they will be handled more intelligently on both sides than would have been the case two months ago when there was so much tension. The works council plan seems to be gaining ground and some of the industry's leaders feel that it already has demonstrated to their employees that outside organizations are neither desirable or necessary for their protection. The

industry is not at all concerned about any trouble over hours and wages. To any efforts aimed at turning the functions of its employment offices over to outside unions, however, it may be counted upon to present a united front.

In the discussions in hotel lobbies and rooms, future body design trends were at least as important a topic as independent wheel suspension. There is no doubt that Chrysler's bold break with the past has raised a question as to whether the time isn't ripe for a revolution in automobile styles. Certainly registration figures on the new "Airflow" jobs and on Hupp's "Aerodyne" designs are going to be of absorbing interest. If they reflect public acceptance, and, incidentally, Chrysler officials report that their checks of public reaction showed a strongly favorable opinion, there is no doubt that the body

die business will boom this year, as the changeover will involve complete new tooling.

A word about the Show itself in conclusion. It was unquestionably the most interesting exhibit ever staged by the N.A.C.C. And it was staged against an attractive background of modernistic decorations that completely concealed the Palace walls and ceilings. Some of the outstanding exhibits included Desoto's wind tunnel and marionettes, Hudson's circular stage with actors carrying on a dialog about its cars, Chrysler's display of its "Airflow" job, the Buick and Oldsmobile demonstrations of the improved riding qualities of their cars using small-scale models on a bumpy, endless belt, Studebaker's marionettes, Graham's mammoth supercharger, Auburn's dual ratio exhibit and Reo's self-shifter display, to mention only a few.

Johnson Plans Further Cut in Work Week

PLANS to reduce working hours in industries under codes, announced by National Recovery Administrator Hugh S. Johnson, at a press conference in Washington on Jan. 10, are consistent with the attitude he has taken from the time the NRA was set-up. No definite number of hours was proposed by General Johnson and it is perhaps doubtful that he has a fixed number in mind. But it is definitely the plan to reduce the hours in industries which are as high as 40 per week.

This is the new work-week schedule of the automobile manufacturing industry. (See news pages of this issue.) It was stepped up from 35-hr. by the order just issued this week by General Johnson himself. The general, however, sees no inconsistency in increasing the hours for the industry while announcing almost immediately after that all industries are to be required to cut hours where they range up to 40. On the contrary, the general said he was obligated to increase the work week in the automobile manufacturing industry.

Reference was made to a clause in the industry's code reserving the right to increase hours. The purpose of increasing the hours in the automobile code, however, was stated to be the taking care of peak demand without making necessary an influx of men into automobile

producing areas seeking jobs where there would be more men than jobs, thus throwing upon communities the burden of taking care of those who were unsuccessful in finding work at automotive plants.

The plan to reduce working hours will be threshed out at a meeting in Washington, probably to begin Feb. 15, of code authorities of all industries. It will be the first meeting of the kind ever held. Not only will the matter of reducing working hours and correlating the new schedules among related industries be planned and apparently determined upon, but trade practices generally will be gone over. It is understood that efforts will be made to simplify and standardize such

practices among all industries.

The effect of reduced hours, however, is receiving the uppermost attention. There are those who question the ability of industries further to cut hours and stay in business. Also it is not uncommon that employees protest against reduced hours for the simple reason their incomes will be reduced inasmuch as there apparently is no present intention of increasing wage rates.

The Johnson formula, however, is midway between the attitude of industries generally and organized labor. Many industries are contending that longer hours are necessary. Organized labor again has resumed its demand for the 30-hr. week.

Two double lines
extending well
around the corners
of the side streets,
waited impatiently
to buy N. Y.
Show tickets on
Saturday



JUST AMONG OURSELVES

Speculative Purchasing

THE purchasing agent may be just as important as the sales manager in determining whether a given company makes a profit or a loss this year. Good management, in the fullest sense of that word, has a chance to shine as never before. The buying policy of the industry today is almost exactly the reverse of what it was in 1929. Quick turnover, based on hand-to-mouth buying was the chief end sought at that time. Now many manufacturers are trying to see how far ahead they possibly can buy without piling up inventories which later changes may make useless. Not for many years has so much importance rested on making the right purchasing decisions; and not for many years has so little factual basis existed for the making of such decisions on a long range basis.

The labor situation unquestionably is better than it was a few weeks ago. Employment is on the increase as the new models get into production and continued evidences arise of satisfaction with employee representation plans on the part of employees.

Hopes are growing that the Spring production peek will bring better management-labor relationships rather than new breaks as was feared some time ago. Time will tell. The fact remains that the automotive industry once more is getting under way and is providing wages

and employment for tens of thousands more men than at this time last year. With the co-operation of its employees, it may be expected to continue at reasonable rates throughout the year.

* * *

N. Y. Show Tempo Breathes Optimism

CROWDS excellent. Showmanship scintillating. Automobiles striking. Hopes high. That summarizes pretty well the impressions left by the opening day of the New York show. The big exhibition this year lived up to its advance notices in every way. To those in the trade, as well as to the public, it was an exciting event—and its whole tempo breathed optimism. Crossed fingers were not entirely absent, but that was only natural in the light of what has happened during the last three years.

Nearly every maker shared in the glories of public interest this year with only a few exceptions. The more radical designs got plenty of attention and were discussed up and down the aisles of the Palace, but the cars with more conservative lines seemed to draw equal interest in many instances.

Saturday morning saw the floors of the exhibit peopled with factory executives, engineers, sales managers and general executives being there for a quick pre-view in almost equal numbers. They seemed to be different men than those we talked with a year ago under similar

circumstances—yet they had the same names and were the same people for the most part. Everybody expects action this year—and seem pretty confident about getting it. Talking with this group brought out some interesting thoughts about the present course of the business.

* * *

Bargain Hunters Still With Us

PRICE is assuming a far more prominent part in the competitive picture than seemed likely before the Show opened. Few lists were announced on the opening day, although General Motors released its prices late on Saturday afternoon and price tags were on the Studebakers and a few others as the show opened.

Sunday, Monday and Tuesday brought further price announcements, however, and the importance of this factor loomed large in the minds of many executives.

Manufacturers recognize that, while the public is getting in a buying mood of late, most people still are looking for bargains. The time has not yet arrived when a few dollars make no difference. Price will be important in this selling season. With this background, rising material costs and the threat of inflation which most executives see in the Roosevelt budget program made pricing a vital and difficult problem on most lines. Price decisions may mean the difference in success and failure on more than one of the new lines, despite the many design features which will furnish special selling points this year.—N. G. S.

More New Models Loom

Tentative plans call for three new lines in next 90 days—Mid-season changes also are again a probability

by A. F. Denham

Detroit Editor, Automotive Industries

NEW YORK is behind us—Chicago still ahead, but already the reactions resulting from that first week of 1934 models are becoming apparent. The industry as a whole isn't satisfied with its 1934 merchandise, spectacular as it is. Salesmanagers and car company executives left Detroit for New York with a high degree of optimism. That optimism still prevails—in fact is increasing—but individual companies are not so sure as they were of their respective positions in the sales picture.

One highly tangible result is that the new model season is going to be extended. Within the next 90 days or so, tentative plans call for the announcement of three new lines of cars if they can be made ready by that time.

One of these is a lower priced addition to a line of medium priced cars. A second is the revision of a 1934 line to include, possibly, independent springing. A third involves mainly a new line of bodies more in keeping with the modern lines appearing at New York.

And that isn't all. For the past two years the industry has tended more and more to the 'announcement-at-show-time' program. This stands a better than 50-50 chance of being upset during 1934. Mid-season changes apparently are to be with us again. For the time being they will apply mainly to those companies which feel that their lines will need bolstering before fall to maintain their competitive positions.

It is possible if the fever spreads that other lines may be affected also, with the idea in mind of maintaining the newly gained competitive strength.

Of what the major mid-season changes will consist is still largely a matter of conjecture of course. There is a feeling that perhaps

sweeping body changes may be necessary. Plans are still flexible and the final program will depend largely on what the next few months demonstrate is desirable by a review of new model sales.

Independent springing—unless some unforeseen obstacle arises—undoubtedly will spread. It won't be a matter of a year either before independent suspension for rear wheels makes its appearance.

A rear-engined car, already scheduled for 1935, may be advanced, if experimentation can be completed, to late summer of 1934. Sample cars are already "in the works."

The industry this year is in a happy position to go ahead. The major companies made money during 1933. They didn't make enough so that they could feel their products were good enough to stand still. They did make enough to break through the ice of directorial objection to large expenditures for important vehicle changes and new tool purchases.

That situation bids well to be repeated for 1934. An analysis of the price situation as far as it is available at this time indicates that the major companies in the industry will not make much more money during 1934 even with a 30 per cent increase in volume than in 1933. Some units definitely would make less as a result of price class isolation, unless their merchandising picture is broadened.

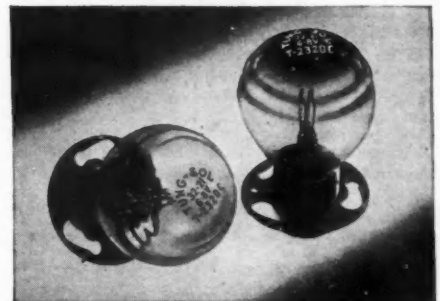
Widespread attempts at expansion of dealer organizations being initiated will prove another factor tending toward earlier introduction of new models, by companies whose position appears to be weakening during the early months of 1934. There is hardly a major vehicle producer today whose plans for 1934 do not include expansion of its dealer organization.

They believe it is warranted by business prospects. They feel that with the protection to the dealer afforded by the new NADA code more dealers will be able to operate profitably on smaller volume than for many years, indicating the possibility of adding dealers in the smaller communities where they have had none recently.

To do this it is necessary to attract organizations back into automotive dealerships. A striking and successful line of cars is essential.

Tung-Sol Has New Fixed Focus Bulb

Tung-Sol Lamp Works, Inc., Newark, N. J., has introduced the flanged fixed-focus type of automobile headlamp bulb and guarantees an accuracy of the focus within one-hundredth of an inch in every direc-



tion. Heretofore, with what was known as the fixed-focus type of bulb, the permissible deviation of the center of the light source from the perfect location was practically 4/100 in. The very much higher precision of the new bulbs permits the use of a smaller housing and of a reflector of reduced diameter, which harmonizes better with modern streamline bodies in that the smaller lamp occasions less air resistance. Better focusing of the source of light, of course, also adds to the efficiency of road illumination.

The bulb is located in the reflector by a clock-wise turn, which snaps it into place accurately and holds it.

1934 Prices Average 10 to 15 P

Chevrolet Master

	New	Old	
2-d. sedan	\$585	\$515	+\$70
Sport roadster	545	485	+ 60
Cabriolet	665	565	+100
Town sedan	615	...	...
4-d. sedan	645	565	+ 80
Business coupe	565	495	+ 70
Sport coupe	605	535	+ 70

Chevrolet Standard

	New	Old	
Coach	\$495	\$455	+\$40
Coupe	485	445	+ 40

Oldsmobile Six

	New	Old	
Business coupe	\$640	\$745	-\$105
Sport coupe	680	780	- 100
5-p. coupe	670	745	- 75
5-p. touring coupe	700	775	- 75
4-d. sedan	730	825	- 95
4-d. touring sedan	760	855	- 95

Oldsmobile Eight

	New	Old	
Business coupe	\$845	\$845	...
Convertible coupe	925	925	...
Sport coupe	880	880	...
5-p. coupe	845	845	...
5-p. touring coupe	875	875	...
4-d. sedan	925	925	...
4-d. touring sedan	955	955	...

Pontiac Eight

	New	Old	
Coupe	\$695	\$635	+\$60
Sport coupe	745	670	+ 75
Cabriolet	785	695	+ 90
2-d. sedan	725	635	+ 90
2-d. touring sedan	765	675	+ 90
4-d. sedan	785	695	+ 90

LaSalle-Fleetwood Bodies

	New
2-p. coupe	\$1,495
2-p. conv. coupe	1,595
5-p. sedan	1,595
5-p. club sedan	1,595

Cadillac V-8

128-in. Wheelbase—Fisher Bodies

	New
2-p. coupe	\$2,395
2-p. conv. coupe	2,495
5-p. conv. sedan	2,695
5-p. town coupe	2,545
5-p. town sedan	2,545
5-p. sedan	2,495

136-in. Wheelbase—Fisher Bodies

	New	Old	
2-p. coupe	\$2,595	\$2,695*	-\$100
2-p. conv. coupe	2,695	2,845*	- 150
5-p. conv. sedan	2,895	...	...
5-p. town sedan	2,745	2,995†	- 250
5-p. sedan	2,695	2,895†	- 200
7-p. sedan	2,845	3,045†	- 200
7-p. imperial	2,995	3,195†	- 200

*134 in. †140 in.

146-in. Wheelbase—Fleetwood Bodies

	New
5-p. sedan	\$3,295
7-p. sedan	3,445
5-p. sedan	3,745
7-p. sedan	3,895

§—Modified "V" windshield.

Note—A total of 20 bodies also are offered on this chassis.

Cadillac V-12

146-in. Wheelbase—Fleetwood Bodies

	New	Old	
5-p. town sedan	\$4,045	\$3,695	+\$350
5-p. sedan	3,995	3,595	+ 400
5-p. imp. cabriolet	4,395	...	...
7-p. sedan	4,145	3,745	+ 400
7-p. limousine	4,345	...	...
7-p. imp. cabriolet	4,545	...	...

Note—A total of 14 bodies with modified "V" windshields, ranging in price from \$4,445 to \$6,295 also are offered on this chassis.

Cadillac V-16

154-in. Wheelbase—Fleetwood Bodies

	New	Old	
5-p. town sedan	\$6,700	...	...
5-p. sedan	6,650	\$6,250	+\$400
5-p. imp. cabriolet	7,050	...	...
7-p. sedan	6,800	6,400	+ 400
7-p. limousine	7,000	6,600	+ 400
7-p. imp. cabriolet	7,200	...	...

Note—A total of 14 bodies with modified "V" windshields, ranging in price from \$7,300 to \$8,950 also are offered on this chassis.

Dodge

117 in. Wheelbase

	New	Old	Change
Coupe	\$645	\$595	+\$50
Rumble seat coupe	695	640	+ 55
2-d. sedan	695	630	+ 65
4-d. sedan	745	675	+ 70
Conv. coupe	745	695	+ 50

121 in. Wheelbase

	New	Old	Change
Brougham	\$835	...	...
Conv. sedan	875	...	...

Plymouth

	Standard			De Luxe		
	New	Old	Change	New	Old	Change
4-d. sedan	\$585	\$510	+\$75	\$650	\$575	+\$75
2-d. sedan	535	465	+ 70	595	525	+ 70
Rumble seat coupe	545	485	+ 60	615	545	+ 70
Bus. coupe	495	445	+ 50	575	495	+ 80
Conv. coupe	...	...	...	660	595	+ 65

Chrysler Eight

	Royal			Imperial		
	New	Old	Change	New	Old	Change
Sedan	\$1,245	\$925	+\$320	\$1,495	\$1,295	+\$200
Coupe	1,245	915	+ 330	1,495	1,275	+ 220
Brougham	1,245	...	...	1,495	...	...
Town sedan	1,245	...	...	1,495	...	...

Chrysler Six

	New	Old	Change
4-d. sedan	\$850	\$785	+\$65
2-d. sedan	800	745	+ 55
Rumble seat coupe	830	775	+ 55
Bus. coupe	790	745	+ 45
Conv. coupe	850	795	+ 55

DeSoto

	New	Old	Change
Sedan	\$995	\$735	+\$240
Coupe	995	705	+ 290
Brougham	995	665	+ 330
Town sedan	995	...	...

Continental Beacon

	New	Old	Change
Coupe	\$425	\$380	+\$45
2-d. sedan	445	...	...
Rumble seat coupe	485	...	...
4-d. sedan	495	395	+100

Hudson Eight

	116 in. Wheelbase Standard			116 in. Wheelbase De Luxe
	New	Old*	Change	
Coach	\$725	\$975	-\$150	\$805
Comp. victoria	755	...	...	835
Sedan	785	1,045	- 260	865
Comp. sedan	815	...	...	895
Rumble seat coupe	745	995	- 250	825
2-p. coupe	695	...	...	...
Conv. coupe	815	1,145	- 330	...

*119 in. wheelbase.

	123 in. Wheelbase		
Standard	New	Old*	Change
Touring sedan..	\$895	\$1,250	—\$355
C o m p . touring sedan	925	....	....
De Luxe			
Club sedan.....	995	1,350	— 355
Brougham	1,095	1,350	— 255

*132 in. wheelbase.

Hupmobile

	117 in. Wheelbase Six	121 In. Wheelbase Six			127½ In. Wheelbase Eight		
		New	Old	Change	New	Old	Change
Sedan	\$795	\$1,095*	\$995	+\$100	\$1,245*	\$1,445	-\$200
Rumble seat coupe...	795	1,195†	995	+ 100	1,345†	....	...
Victoria .....	...	1,115†	1,060	+ 55	1,265†	1,510	- 245

*Six passenger.

†Five passenger.

Ford V-8 Trucks

	131½ in. Wheelbase Price	157 in. Wheelbase Price	112 in. Wheelbase Price
Chassis	\$500	\$520	\$360
Stake	665	730	...
Platform	650	690	...
Panel	750	860	550
De Luxe panel	780	...	565
Pick-up	...	...	470
Sedan delivery	...	...	565

5 Per Cent Higher Than in 1933

Graham

	Standard Six			De Luxe Six			Special Eight			Standard Eight			Custom Eight		
	New	Old	Change	New	Old	Change	New	Old	Change	New	Old	Change	New	Old	Change
Bus. coupe.....	\$695	\$745	—50	\$805	\$875	—70	\$965	\$845	+\$120						
Rumble seat coupe.....	745	795	—50	855	925	—70	1,015	895	+\$120				\$1,295	\$1,095	+\$200
Conv. coupe.....	845	835	+10	...	995	...	...	935	...				1,295	...	...
4-d. sedan.....	745	795	—50	855	925	—70	1,015	895	+\$120				1,295	1,095	+\$200
7-p. sedan.....	...	...	...	...	...	...	...	...	...				1,695	...	...

Terraplane Six

	112 in. Wheelbase Standard			116 in. Wheelbase De Luxe		
	New	Old	Change	New	Old	Change
Coach.....	\$590	\$505*	+\$85	\$670	...	...
Comp. victoria.....	620	...	...	700	...	...
Sedan.....	650	555*	+\$95	730	...	...
Comp. sedan.....	680	...	...	760	...	...
Rumble seat coupe.....	610	535*	+\$75	690	...	...
2-p. coupe.....	560	485*	+\$75	...	...	...
Conv. coupe.....	670	575†	+\$95	740	...	...

*106 in. truck wheelbase.

†113 in. truck wheelbase.

Lafayette

	New
2-d. sedan.....	\$645
2-d. sedan with trunk.....	685
4-d. sedan.....	695
2-p. coupe.....	635
4-p. rumble seat coupe.....	675

Auburn

	Standard Six			Custom Six			Standard Eight			Custom Eight		
	New	Old	Change	New	Old	Change	New	Old	Change	New	Old	Change
Brougham...	\$695	\$795	—100	\$945	\$795	+\$150				\$1,075	\$945	+\$130
Sedan.....	745	845	—100	995	845	+\$150				1,125	995	+\$130
Cabriolet.....	795	895	—100	1,045	895	+\$150				1,175	1,045	+\$130
Phaeton.....	...	945	...	...	...	...				1,225	...	...

Pierce-Arrow

	138-in. Wheelbase		840 A		1240 A	
	New	Old	New	Old	New	Old
Chassis, spare wheel at rear.....	\$2,350	...	\$2,750	...	\$2,750	...
5-p. sedan.....	2,895	\$2,575	3,295	2,975	3,295	2,975
5-p. club sedan.....	2,995	2,695	3,395	3,095	3,395	3,095
5-p. club brougham.....	2,795	2,385	3,195	2,785	3,195	2,785
Rumble seat coupe.....	2,895	...	3,295	...	3,295	...
Rumble seat conv. coupe.....	2,995	...	3,395	...	3,395	...
144-in. Wheelbase						
Chassis, spare wheel at rear.....	2,575	...	2,975	...	2,975	...
7-p. sedan.....	3,200	2,850	3,600	3,250	3,600	3,250
7-p. enc. drive limousine.....	3,350	2,975	3,750	3,375	3,750	3,375
Silver Arrow.....	3,495	...	3,895	...	3,895	...
Brinn town brougham.....	4,995	...	5,395	...	5,395	...
147-in. Wheelbase						
Chassis, spare wheel at rear.....	\$3,600	...	\$4,535	...	\$4,535	...
7-p. sedan.....	4,295	4,800	4,800	5,305	4,800	5,305
7-p. enc. drive limousine.....	4,495	4,800	4,800	5,305	4,800	5,305

Exports and Imports for the Automotive Industry for November and Eleven Months Ended November, 1933-1932

	November 1933		November 1932		Eleven Months Ended November 1933		Eleven Months Ended November 1932	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobiles, parts and accessories.....	...	\$7,342,992	...	\$4,371,364	...	\$81,324,516	...	\$71,181,755
Motor trucks, buses and chassis (total).....	3,176	1,878,429	1,349	785,371	37,056	17,215,675	22,612	10,534,409
Under one ton.....	395	140,356	27	8,751	4,201	1,236,502	2,061	559,174
One and up to 1½ tons.....	1,842	886,655	1,050	517,753	27,340	10,519,319	17,980	7,236,069
Over 1½ tons to 2½ tons.....	778	629,902	210	177,721	4,214	3,447,062	1,872	1,547,037
Over 2½ tons.....	136	204,943	54	78,206	1,053	1,880,689	695	1,192,521
PASSENGER CARS								
Passenger cars and chassis.....	3,527	2,041,771	1,763	984,719	61,445	30,298,439	38,007	21,990,957
Low price range \$850 inclusive.....	3,159	1,675,255	1,572	809,175	57,034	25,355,896	33,013	15,870,442
Medium price range over \$850 to \$1,200.....	199	186,613	82	77,906	2,427	2,339,647	3,165	3,007,973
\$1,200 to \$2,000.....	61	100,864	34	46,308	1,021	1,556,580	1,190	1,572,137
Over \$2,000.....	19	51,726	13	32,862	303	791,244	576	1,503,625
PARTS, etc.								
Parts except engines and tires.....	...	1,264,714	...	1,155,450	...	16,186,115	...	19,746,971
Automobile unit assemblies.....	...	1,601,193	...	915,611	...	11,836,463	...	11,976,208
Automobile parts for replacement (n.e.s.)...	...	198,806	...	123,693	...	1,377,523	...	1,351,954
Automobile accessories (n.e.s.).....	...	137,729	...	84,891	...	929,114	...	1,043,434
Airplanes, seaplanes and other aircraft.....	34	471,876	44	906,058	376	5,180,569	241	3,523,227
Parts of airplanes, except engines and tires..	...	142,446	...	424,326	...	2,114,149	...	1,497,262
INTERNAL COMBUSTION ENGINES								
Stationary and Portable:								
Diesel and semi-Diesel.....	9	25,270	2	46,571	37	133,545	46	188,312
Other stationary and portable:								
Not over 10 hp.....	316	19,924	189	12,928	2,916	185,685	3,696	237,383
Over 10 hp.....	36	15,883	41	14,592	698	291,420	656	321,026
Automobile engines for:								
Motor trucks and buses.....	228	38,488	25	13,997	1,914	257,215	1,619	274,612
Passenger cars.....	186	15,712	1,335	102,907	18,747	1,138,635	19,941	1,516,626
Aircraft.....	341	102,682	974	173,408	2,633	1,221,517	2,303	1,103,119
Accessories and parts (carburetors).....	...	83,090	...	68,958	...	875,420	...	...
IMPORTS								
Automobile and chassis (dutiable).....	62	34,034	68	24,324	492	274,577	494	233,204
Other vehicles and parts for them (dutiable)	...	8,194	...	9,401	...	108,370	...	62,242

1934 Automobiles Mark Real Turning Point In Industry's Design Trends

Reduced air resistance, independent springing, higher compressions with aluminum heads, bigger tires, improved engine controls and still further increases in power are among developments

THERE have been few years in automobile history, and certainly none since the beginning of the recent depression, which have witnessed such drastic and numerous changes in passenger-car design as 1934. As already pointed out in the brief review in our issue of Dec. 30, the chief developments of the year are the adoption of independent springing by a powerful section of the industry, and much more pronounced streamlining in a few models coupled with closer approaches to streamlined forms in the majority of cars offered.

For the present, independent springing is limited to the front end, where, according to a consensus of opinion, it can be of greatest benefit. At the beginning of 1934, front independent suspension is standard on all General Motors lines and on the Plymouth, Chrysler Six and Dodge lines of Chrysler; it is optional at extra cost on the Hudson, Terraplane and LaFayette.

Three Systems of Springing

While eleven different makes of cars can thus be had independently sprung at the front, only three different systems are being offered. In four General Motors and the two Chrysler lines the steering head on each side is connected to the chassis frame by two wishbone-shaped links of unequal length, one above the other, a coiled spring being interposed between the lower link and a frame bracket; in two of the General Motors lines the so-called Dubonnet system is used, which comprises a housing enclosing a coiled spring and adapted to be swung around the steering pivot or kingpin for steering, a sort of bell-crank mounted in bearings in the housing pressing against the spring with one arm and supporting the front-wheel spindle at the end of the other.

The remaining three makes, which offer front independent springing as an option only, make use of the Baker front axle, in which the central portion of a conventional front-axle center is replaced by two parallel links, one above the other, jointed to the T-shaped inner ends of the outer portions of the axle center. The usual leaf springs are retained, but since their centers are not held in a fixed relation to each other by a rigid member, their action is modified materially.

by P. M. Heldt

Engineering Editor, Automotive Industries

In the past, the principal advantages claimed for independent springing were that it reduces the unsprung weight, thereby improving the riding qualities, and that it practically eliminates front-end instability in the forms of shimmy and tramp. The first-mentioned advantage evidently was claimed particularly for that system of independent springing in which two or more transverse leaf springs replace the usual rigid axle, which system is being used abroad to quite an extent. Since there are at least five different systems of independent springing and each system can be worked out in different ways, it is obviously quite difficult to discuss the subject in a general way, as certain systems possess advantages and disadvantages which others lack.

One of the greatest advantages of at least two of the systems now being introduced in this country is that they permit of the use of much softer springs, and consequently greatly increased spring action, than the conventional front springing system. With the latter, the deflection under normal static load, as well as the maximum additional deflection under shock, is limited to about 2 in. If the front springs are made softer and both spring ranges are increased, then there is likelihood of trouble from shimmy and tramp, uncertain steering, and from interference between the crankcase and front-axle center, or, alternately, too high a center of gravity. As examples of how the flexibility of the front springs has been increased in the independently sprung cars it may be mentioned that in the Cadillac the total range of spring action is 8 in. (as compared with the 4 in. mentioned above) and in the Chevrolet the virtual "rate" of the front springs is 115 lb. per in., as compared with 345 lb. formerly.

These softer front springs naturally reduce the frequency of vibration of the front end, and thus make the car easier riding. However, in actual operation each end of the car does not vibrate independently, as a rule. If the front wheels are dealt a blow by a road obstruction, and the blow in reduced measure is transmitted to the forward portion of the spring-suspended mass, this mass, being freely supported at both ends, is set vibrating around a transverse axis through its center of gravity, resulting in what is known as a pitching motion. To prevent objectionable effects of pitching, the frequency must be reduced below a certain value; making the springs softer tends in this direction, and the effect can be further added to by increasing the moment of inertia of the mass around the transverse axis, by moving as much of the weight as possible as far as possible from the axis of oscillation. This, it appears, can be accomplished most readily by moving the powerplant forward from its usual position, and thus we find that on practically all cars with independent suspension the engines are located farther forward relative to the steering heads, the distance of the shift varying from 2 in. in some of the cars to 20 in. in the Chrysler. The latter is one of the most thoroughly streamlined cars, and there is, of course, a possibility that the decision to shift the powerplant so far forward was based on considerations of both riding quality and facility of streamlining the forward part of the body.

More Power

The great motivating agent behind the majority of engine and chassis changes is the desire for still greater specific power, permitting greater acceleration and greater maximum speed. Engine power has been increased in many instances by increasing the displacement; about equally

Averages of American Passenger-Car Engine Characteristics for a Five-Year Period

Year	Average Cyl. No.	Displacement		Hp.	Compr. Ratio	R.P.M.	B.M.E.P.
		Total	Per Cylinder				
1930.....	7.04	265	37.6	87.6	5.15	3170	82.7
1931.....	7.49	276	36.8	95.0	5.23	3230	84.3
1932.....	7.78	285	36.7	101.0	5.29	3250	86.2
1933.....	7.88	284	36.0	106.5	5.57	3360	88.5
1934.....	7.97	289	36.2	112.5	5.72	3420	90.1

often by increasing the compression ratio, and in some cases by improving the breathing or induction system. The trend in this direction during the past five years is clearly shown by the accompanying table. It will be seen that the average engine displacement increased from year to year, with one exception; the average compression ratio increased uninterruptedly, resulting in a continuous increase in the brake mean effective pressure; and the average peaking speed also increased uniformly. Each of these three factors—displacement, brake mean effective pressure, and speed of rotation—boosts the horsepower output in direct proportion, and the three together during a period of four years raised the average engine rating by more than 28 per cent. The average rating of all American passenger-car models for 1934 is 112.5 hp.

Piston displacement was increased in some instances by an increase in the bore and in others by an increase in the stroke. The horsepower of the engine, of course, increases much faster with the bore than with the stroke, and the reason for changing the stroke rather than the bore in some cases is probably that it necessitates fewer changes in patterns, dies, etc.

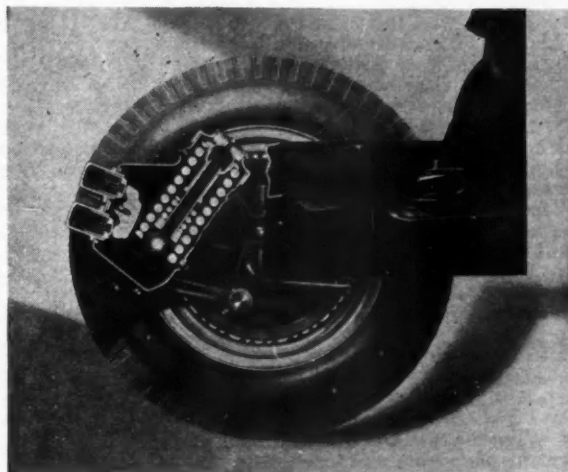
Increased Compression

That the b.m.e.p. and the peaking speed were not carried higher previously is due to technical difficulties which could be overcome only gradually. The much higher average compression ratio this year as compared with 1930 is rendered practical by improvement in the fuels marketed, in compression-chamber forms, in spark plugs (14-mm. plug, for instance) and by the general use of alloys of high heat conductivity for pistons and (to a lesser extent) cylinder heads. Increase in the peaking speeds has been made possible by the use of lighter reciprocating parts and of more rigid engine blocks, crankshafts, connecting rods, etc. Improvements in the induction system, reducing the resistance to air flow of the inlet tract and improving the charge distribution, also have helped.

A notable convert to the aluminum-alloy piston this year is Cadillac, which has adopted the high-silicon aluminum-alloy Lo-Ex, with low heat-expansion coefficient, and the T-slot-type, cam-ground design of piston, giving a special finish to the bearing surface which increases its hardness and wear resistance. This same type of aluminum piston has been adopted by several other makers.

Increased engine speeds bring with them increased bearing loads, and

Cut-away view of the Dubonnet type independent springing on the Pontiac



that a practical limit in bearing loading had been reached in many instances is obvious from the rather numerous cases in which either the bearing capacity has been increased or else the load on the bearings has been decreased by changes having nothing to do with engine speed. Thus bearing sizes were increased on the Dodge, Chrysler and Terraplane, while the crankshaft counterweighting was improved or extended on the Hupp Six, Plymouth, Dodge, Lincoln and Terraplane.

An innovation of considerable importance is the adoption of a cast crankshaft for the Ford V-eight. The material used is an iron-copper-chromium-silicon alloy and is said to contain only about one per cent of total carbon, so that it can be classed as steel (cast iron usually has a total carbon content of 3 per cent or over). It is understood that the tensile properties of this material are not far from those of the forging steel normally used for crankshafts, while its hardness and wear resistance are greater. Castings would seem to offer particular advantages where the crankshaft is of a complicated form difficult to forge, like the two-plane crankshaft of a V-eight with integral counterweights.

The use of cast iron for camshafts, introduced on the Terraplane a year ago, has been extended, DeSoto and Dodge now also employing them. A few manufacturers have made changes in their connecting rods; one forges the caps separately and provides them with ribbing for increased rigidity with minimum increase in weight, and another uses a steel with an unusually high manganese content. Replaceable steel-back bearings have come into much wider use, and in some in-

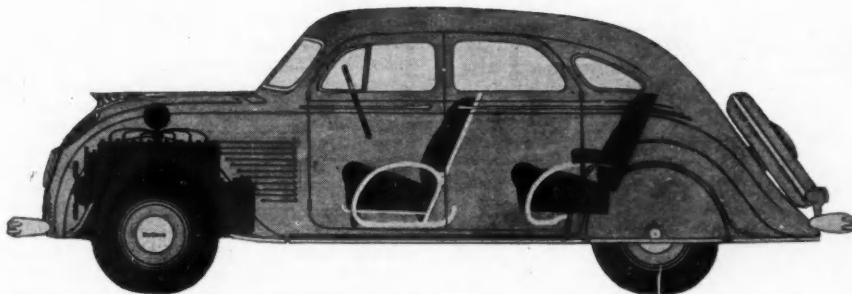
stances a copper-lead alloy is used for the bearing material instead of the usual babbitt.

Aluminum-alloy cylinder heads, first introduced on the Graham some years ago, have made considerable headway, being standard equipment now on the Graham, Cord, Lincoln, Auburn and Chrysler Custom Eight, and an optional extra on the Dodge. The Hudson and Terraplane deluxe models come with composite aluminum and iron heads.

Exhaust valve seat inserts are continued by the several makers who have used them in the past; a change in the material of these inserts to alloy cast iron has been made by Plymouth. Other makers have sought to increase the life of valve seats by other means; thus, a widening of the valve seats in the Chevrolet and the use of high-chromium iron in the cylinder block of the Hudson undoubtedly tend in this direction. In the Chevrolet the arrangement of the valves in the cylinder head (exhaust valve inclined) has been changed in such a manner as to permit of the use of larger valves, which in conjunction with a higher lift gives materially increased breathing capacity, while the anti-detonating features are retained.

Improved Induction Systems

Notable results from improvements in the induction system were obtained in the new Ford, which has a dual manifold and a dual carburetor. When this car was first brought out, a comparison with other engines showed that its specific output was comparatively low, in view of the speed and compression ratio of the engine. The writer then ventured the opinion that the engine was purposely throttled, possibly to limit the bearing load or protect the valves. It now appears that the rather low specific output was due to unequal distribution. Apparently, with an eight-cylinder engine with even sequence of explosions, uniform charge distribution and a high specific output are possible only with dual inlet manifolds, so designed that cylinders firing in direct succession never draw through the same section of the manifold. As suction impulses in the same section then follow one another at 180 deg. of crank motion and each suction period corresponds to about 230 deg. of crank motion, there is some overlapping of suction periods in each section even then. However, during these periods



This phantom view of the DeSoto illustrates the new plan of weight distribution and incidentally the better, more forward location of the rear seat

of overlap the inlet valves of both cylinders concerned are only slightly off their seats, so that the suction effect is not very strong, and the required rate of flow through the manifold therefore is not abnormal.

There is being offered this year for the first time an American stock car regularly equipped with a separate supercharger—the Graham. Not only has a supercharger been added to the eight-cylinder engine, but the cylinder bore has been increased, so that the power output was increased 45 per cent. A supercharger alters the characteristics of an engine, because it becomes more effective as the speed increases, and the speed of maximum torque is therefore carried considerably higher. The chief advantage of the supercharger no doubt is that it permits of bursts of acceleration at comparatively high speeds, which is valuable particularly for overtaking on two-lane roads with heavy traffic. Application of a high-speed centrifugal supercharger to a stock car involves difficult problems, and these have been solved in an interesting manner.

Numerous improvements have been made in connection with the induction system. Automatic chokes, first used on the Oldsmobile two years ago, have become quite common. It has been found, moreover, that the action of the choke can be improved if, in addition to control by a thermostat, it has control of manifold vacuum. With most carburetors, a sudden opening of the throttle while the engine is still relatively cold tends to interfere with the mixture proportion, causing the engine to lose power. This can be prevented by so arranging matters that both the heating up of the thermostat and increase in the inlet manifold vacuum tend to pull the choke open. If the throttle is suddenly opened during the warming-up period the inlet manifold vacuum is reduced and the choke is partly closed again, which enriches the mixture and keeps the engine going. It appears that there are now three automatic chokes available to engine manufacturers, as compared with one a year ago. In several cars the engine can be set for fast idling by means of the choke control.

In the Hudson a poppet-type back fire valve is fitted into the disk of the choke valve, to prevent injury to the induction system in the event of a backfire through the carburetor while the choke is closed. Another innovation by Hudson is the addition of a dashpot to the throttle control, designed to prevent too rapid closing of

Table Showing Variation in Number of Engine Models in Passenger Cars

Year	No. Listed	Loss from Previous Year
1930.....	92	
1931.....	78	14
1932.....	73	5
1933.....	66	7
1934.....	62	4

the valve—and consequent lurching of the car due to the braking action of the engine—when the foot is suddenly taken off the accelerator pedal.

A rather interesting feature of the new Cadillacs and the LaSalle is that the air intake for the carburetor, instead of being located under the hood, is outside the engine space, where the temperature is said to be approximately 100 deg. F. lower under normal operating conditions. The air is taken in through passages extending through the radiator, there being one such passage in the case of the straight-eight LaSalle and two in the case of the V-eight Cadillacs. Since the mass of air taken in by an engine—to which the indicated horsepower is proportional—varies inversely as the square root of the absolute temperature, if we take the normal atmospheric temperature to be 60 deg. and the corresponding under-the-hood temperature, 160 deg., the absolute temperatures are 520 and 620 deg., and the proportional increase in engine power that would be expected is $\sqrt{620/520} - 1.00 = 0.092$, or nearly 10 per cent.

Vacuum Spark Control

Several more cars this year feature spark-timing control by the inlet-manifold vacuum in addition to control by the engine speed. The general effect of vacuum control is to advance the spark more for part throttle than for full-throttle operation, for the same speed of rotation. If the engine is running under part throttle and in consequence receives only a small charge per cycle, it will stand a greater spark advance without detonating, which is advantageous because it increases the fuel economy.

In the Chevrolet a refinement has been introduced in connection with the vacuum control, in that an air bleed is provided in the vacuum chamber which is controlled by the throttle lever in such a manner that the effect of manifold vacuum on the spark timing is reduced as the throttle is

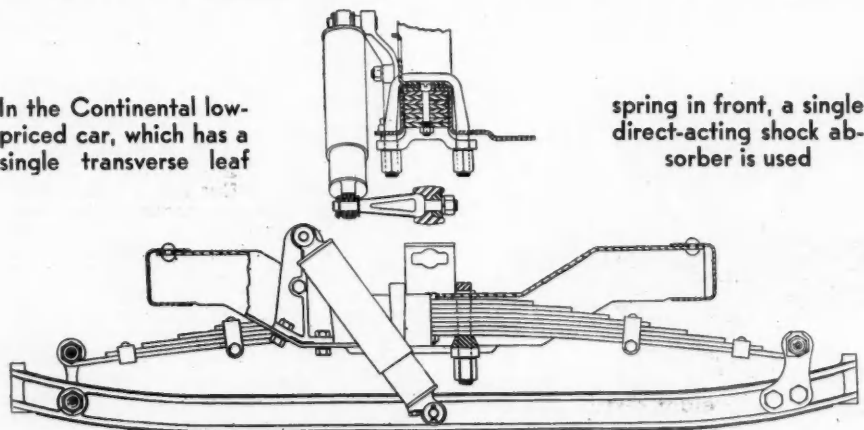
opened wide. On the same car provision has been made for checking the timing of the spark with the engine running, by means of a neon flash light. This flashlight is connected in circuit with the spark plug in cylinder No. 1. A steel ball is set into the flywheel and is directly opposite an arrowhead on the flywheel housing, if at the time cylinder No. 1 fires with the spark lever in a certain position, the timing is correct. The flashes of the neon light show the relative positions of the steel ball and arrowhead when the spark occurs in cylinder No. 1, and adjustments, of course, can be made by moving the distributor housing angularly. Practically all cars are now equipped to receive a radio receiver, and in at least one case certain changes have been made in the parts of the ignition system to prevent interference with radio reception.

Ever since generators were first installed, additional uses have been found for electric current on passenger cars, and the drain on batteries has increased correspondingly. The greatest single additional load on the battery is undoubtedly the radio receiver, which is now installed on many cars. To meet the new requirements, recourse is had to either constant-voltage control, or to what is known as lamp-load control. With the former system, since the generator terminal voltage is kept constant, the charging rate automatically increases as the battery becomes discharged and its voltage decreases. Thus the charging rate is dependent upon the state of battery charge. With lamp-load control the current output of the generator is maintained constant, regardless of speed, as long as there is no lamp load. As soon as lamps are turned on the current output of the generator is increased. Both of these systems involve the use of a vibrator, similar in principle to that of the electric bell, which cuts a resistance into and out of the generator field circuit alternately. Such a device is subject to mechanical stress in the spring and heat stress in the contact points, but that it can be made entirely practical is shown by its successful use on buses for years past.

On the Cadillacs and the LaSalle, which employ lamp-load control—an additional thermostatic control is provided which has the effect of increasing the generator output when the temperature under the hood is low. This consists of a bimetallic strip which serves as a hinge or mount for the armature of the magnetic vibrator. The strip exerts a certain elastic force, tending to keep the armature away from the core, which decreases as the temperature rises. The advantage of this thermostatic control is that it increases the charging rate in cars which are driven only short distances between stops (and hardly ever get really warm under the hood), so that the engine has to be cranked frequently, which results in a heavy drain on the battery.

To enable them to safely carry the greater loads called for by increased current consumption, many of the generators are provided with a forced cooling system. In some cases an air scoop is provided which intensifies the circulation of air over—and hence the cooling effect on—the generator, while in other cases the air is circulated through the generator by a fan.

In the Continental low-priced car, which has a single transverse leaf



spring in front, a single direct-acting shock absorber is used

Engine starting is now accomplished on more cars by means of a button mounted on the dash (instead of the foot button alongside the accelerator pedal). Pressing this button closes a circuit and energizes a solenoid mounted on top of the starter motor which closes the starter switch. As soon as the engine is started, a switch actuated by the vacuum in the inlet manifold opens the starter circuit, the switch being held open by a latch until the accelerator pedal is fully released. In the Buick, however, the solenoid circuit is closed by means of either the accelerator pedal or the throttle lever and the starter cannot be energized unless the ignition switch is closed.

Engine Lubrication

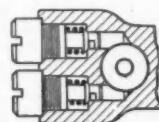
As regards engine lubrication, it is notable that even in the lower-priced cars there is a tendency to extend the pressure system to the piston pins, which, since it involves rifle-drilling of all connecting rods, entails considerable expense. Among the new low-priced cars having this feature are the new Hupp Six and the LaFayette. Oil consumption has become a matter of concern, with the constant increase in engine speeds, and several makers have taken steps to reduce it. Thus in the new Ford, piston design has been modified, new piston rings adopted, baffle plates provided over the oil-return holes in the valve chamber, and the oil-pan tray redesigned so as to permit of a faster return of the oil to the crankcase—all with this end in view. In the Pontiac an automatic by-pass has been provided on the crankcase ventilating system which reduces the rate of air circulation through the crankcase at high car speeds and thus the loss of oil.

Packard and Lincoln now fit oil-temperature regulators, often referred to as oil coolers, while in the Hudson efforts have been made to reduce the temperature of the crankcase oil by increasing the rate of oil circulation and of crankcase ventilation, and by increasing the number of oil deflectors in the crankpan, these serving as heat absorbers.

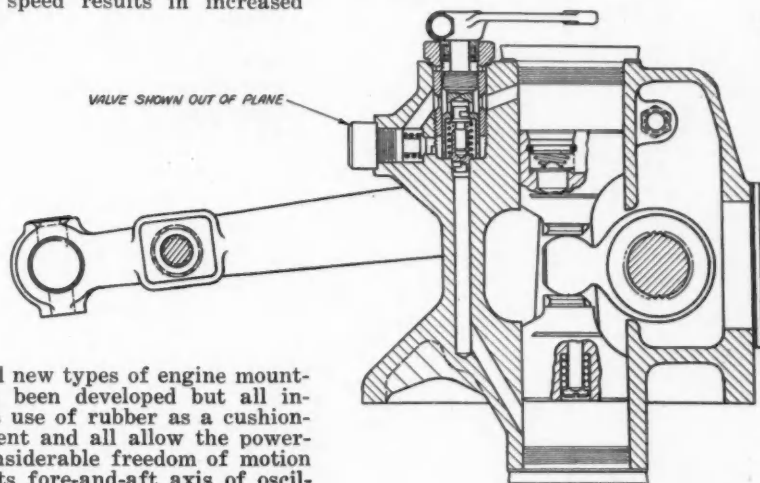
There have been some changes also in the cooling system. Circulation is now generally controlled by thermostats on the by-pass principle, and such control is making its appearance on cars in the lowest price class. Several changes have been made in the DeSoto and Chrysler cooling

systems, which evidently were prompted by the radical change in body design. With the engine so much closer to the top of the engine compartment than formerly, there is less vertical space for the radiator, and a cross-flow radiator is therefore used. Besides, there is a separate supply tank, provided with filler, on a body panel adjacent to the engine. Another result of the change in the relative positions of engine and radiator in the Chrysler and DeSoto is the mounting of the radiator fan on the crankshaft, doing away with the usual fan drive. In addition to eliminating power loss in transmission, the use of a fan of larger diameter rotating at lower speed results in increased economy.

instead of the conventional pin fulcrum. As an example of the reduction in clutch-pedal pressure required the case of the Packard Eight may be cited, in which it was sealed down from 35 to 23 lb. Changes evidently made with a view to increasing the life of clutch parts and improve their operating conditions include the adoption of hardened steel for the clutch-



Section through Delco shock absorber of Cadillac



Several new types of engine mounting have been developed but all involve the use of rubber as a cushioning element and all allow the powerplant considerable freedom of motion around its fore-and-aft axis of oscillation. In two of these systems use is made of radial members, the powerplant being supported at one end by two links or bolts, whose center lines normally extend radially from the axis of oscillation. Rubber cushions or bushings are inserted between the various metallic members of the mounting.

Rather a departure is represented by the rear mountings of Hudsons and Terraplanes. Here rubber blocks are inserted between the transmission housing and arms extending from the frame side rails, and the length of these arms can be adjusted so as to vary the degree of axial freedom of the powerplant, and the damping action.

Clutches

Clutches have been the subject of considerable attention.

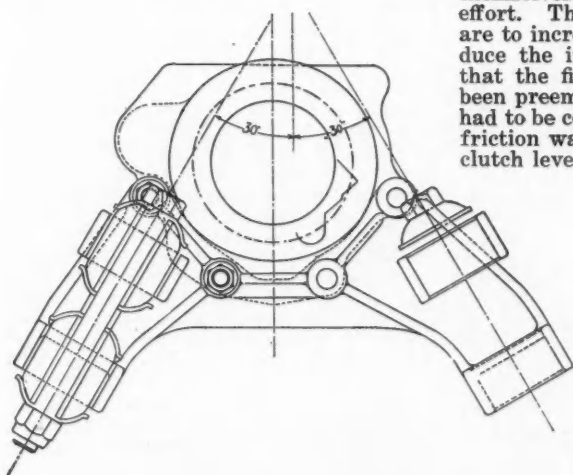
During the past year, engineers set themselves the task to reduce clutch effort. The two obvious possibilities are to increase the pedal ratio and reduce the internal friction. It seems that the first possibility already had been preempted, so the last mentioned had to be concentrated upon. Internal friction was reduced by providing the clutch levers with so-called knife-edge

throwout unit on the Olds and the casting of driving posts on the pressure plate of the Chevrolet clutch, which contact with the sides of broached holes in the clutch cover, this arrangement taking the place of driving slots in the pressure plate. In the Chevrolet, moreover, the clutch control linkage was so altered that angular movement of the engine does not affect the position of the pedal.

There has been an increase in the number of transmissions which have quiet helical gears for all speeds (Nash, Buick, Olds). Hudson, to prevent noise from idling low-speed and reverse gears when driving in either high or intermediate, provides means for automatically unmeshing these gears. Freewheeling has been made an option on one or two cars which formerly had it as standard equipment. The most important innovation in the transmission line is the provision of an automatic overdrive on the Chrysler. This consists of a planetary set combined with the transmission. This gear is controlled by a vacuum-actuated clutch and is shifted into overdrive as soon as the car attains a certain speed in direct drive. The clutch, moreover, is interlocked with the free-wheeling unit so that overdrive can be engaged only when the free-wheeling unit is active. This is evidently a safety precaution, preventing clashing when the change occurs.

Needle Bearings

It appears that all of the regular manufacturers of universal joints now manufacture joints of the needle-bearing type, and their use has become quite common. A deviation in this respect from conventional practice is



Sketch of Hupp power-plant rear-end mounting

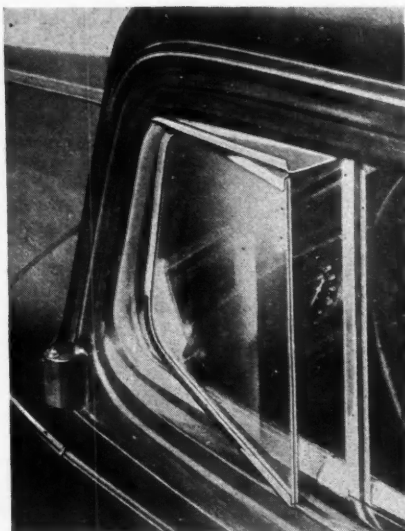
found on the Nash, which has a rubber-block type of universal; this, of course, requires no lubrication and also is silent in action.

The propeller shaft problem has been rendered more difficult through the increase in engine speed and the forward shift of the powerplants mentioned earlier in this article, since both an increase in speed and lengthening of the shaft promote "whip" or whirling. To meet this condition, propeller shafts on several cars on which they were solid in the past are now made tubular (Buick, Chevrolet), while in the case of the Cadillac the length of the propeller shaft has been reduced by providing the transmission case with a rearward extension enclosing an intermediate shaft coupled to the transmission mainshaft. On the Chrysler, on which the powerplant was moved forward some 20 in. and the length of the propeller shaft therefore greatly increased, and on which the shaft already was tubular, its diameter was increased. The hypoid gear type of final drive appears on one of the entirely new 1934 models and on one model that had worm drive before. A noteworthy change in practice is the adoption of the Hotchkiss drive by Cadillac, long considered the foremost champion of torque-tube drive. The torque-tube drive, of course, has definite advantages, but it is associated with high unsprung weight, which is a handicap when it is desired to improve riding qualities to the limit. Dual-ratio rear axles are this year standard on the Auburn Twelve and the Custom Eight only, and the shift from one ratio to the other has been made easier by the provision of a synchronizing device. Plymouth has substituted chrome-molybdenum for chrome nickel steel for rear-axle shafts. Tabular front axles are found on the Chryslers and on the new low-priced Hupp Six. A change in the design of the Continental consists in the substitution of a long, wishbone-type of radius rod at the front axle for the short plain rods used last year, which change was made to eliminate a tendency for the front wheels to "wander."

For use in connection with the parallel-link type of independent front suspension a tire with a special form of tread was developed. It seems that in spite of the difference in the lengths of the links, which is intended to keep the track constant, there is a slight tendency for the track to change with spring action, and the tires to squeal if the tread is sharp-edged. This is prevented by rounding off the edge. Tire sizes have been increased in many cases and recommended inflation pressures reduced. The type of wheel that has gained most perceptibly since last year is the artillery steel-spoke type. Where wire wheels are used the spokes are now often hidden by disks or large hub caps.

Power Brakes

Power brakes have made further gains, the vacuum type having been adopted for the larger Buicks and the Auburn Custom Eight, while apparently all those which already employed this type of power unit have continued it. Pierce Arrows continue to be equipped with the Stewart Warner system of mechanical power braking. Several additional makes



Triangular drip molding of Fisher bodies

have adopted cast-iron brake drums or the type composed of a cast-iron shell cast onto a steel disk; Pontiac continues pressed steel brake drums, but uses a steel with higher carbon and higher manganese content. A noteworthy change in brake practice is the change-over of two General Motors lines, La Salle and Olds, to hydraulically-operated brakes. Hudson provides more effective protection against the entrance of water into the rear-wheel brakes by fitting baffle plates which give a double seal between the drum and backing plate. The Studebaker Six has Steel-draulic brakes.

Steering Gears

In the steering mechanism a number of changes have been made with a view to reducing the amount of effort required to operate it. This was rendered necessary partly by the change to tires of wider section, which increase the frictional moment between the tire and ground, and partly by the adoption (by two makers) of a form of independent springing with which the wheels at all times remain parallel with the body, and centrifugal force therefore causes them to lean outward on turns. As there is no self-restoring force, it would be necessary to pull harder on the steering wheel in righting the car again, were it not for the increase in ratio and the improvement in the efficiency of the gear. Steering gear ratios have been increased by Buick, Pontiac, Chrysler, Olds, Chevrolet and Ford, and in the large Buick the overall ratio is now 23.5 to 1, which is nearly twice as large as the average 15 years ago.

Steering gears themselves have been rendered more efficient by the more liberal use of ball and roller bearings. Gears in which there is rolling instead of sliding friction between the members are used in increased numbers, and anti-friction bearings are used for the roller. On all of the Chrysler lines the steering posts are given an unusually large rake, which contributes to comfort in driving and is made possible by cross steering in which the drag link extends substantially parallel with the

front axle. In the Chrysler and DeSoto models the steering gear housing is located ahead of the front axle, which arrangement is made practical in these cars by the fact that the engine compartment extends well forward of the axle, thus hiding the gear and its connections.

With the front-axle center the steering tie rod has been eliminated. The axle center holds the steering knuckles a definite distance apart and the ends of the knuckle arms therefore must also be kept a certain distance apart to hold the front wheels to a definite toe-in. With the independent springing system in which the front wheels are connected to the chassis frame by links, the distance between knuckles varies with the spring action and the distance between the ends of knuckle arms must vary correspondingly if the toe-in is to remain the same. This is assured by using separate steering links to both knuckles whose connection to the intermediate steering arm, at the center of the frame, lies close to the axis of the inner hinge joints of the wishbones which connect the steering heads to the frame. These separate steering links evidently should not be regarded as a separate improvement but as an essential element to the independent springing system.

Frames

Frames have been further stiffened, except in the case of the DeSoto and Chrysler, where the stresses ordinarily taken by the chassis frame are taken on the body framing, the chassis frame being retained only for convenience in assembling. Where independent springing was adopted, the front end of the frame, of course, had to be entirely redesigned. X members near the center of the frame are now practically universal, and many frames have substantial braces between other cross members and side rails. The forward legs of the X member (and sometimes the rear legs also) are extended parallel with the side rails and welded or riveted to the latter to form box sections. Welding, on the whole, is more extensively used in the production of frames than in the past. In the Cadillac the front cross member consists of two pressings welded together and to the side rails.

The activity in shock absorber development initiated by the appearance of "ride control" some years ago has continued during the past year. In all of the cars regularly equipped with independent springing, the shock absorbers have been neatly worked into the springing system. Where the springing is of the parallel-link type, the upper wishbone link forms the shock-absorber arm. This construction is used on the Cadillac, for instance, which is fitted with Delco-Products shock absorbers, of which a sectional view is shown herewith. The action of these shock absorbers is controllable from the dash. The housing of the shock absorber is bolted to a malleable casting on top of the front cross member at the side rail, in such a manner that the casting is subjected to compression only. Both ends of the shock absorber shaft extend through the housing and there is a bearing near each end.

Manual control is effected by changing the size of the orifices through which fluid is discharged from the cylinders. The maximum effect is

limited, however, by a "pop-off" valve located just below the manual-control valve assembly.

A new type of shock absorber is used on the new Ford V Eight. It eliminates the effect of temperature variations on the damping effect or on shock-absorber action. With the usual hydraulic shock absorber the effect is greatly intensified as the temperature drops and the oil becomes more viscous. This is due to the fact that the fluid moved by the shock-absorber pistons has to flow through passages that are quite long compared to their diameter, which results in streamline flow. With streamline flow the resistance is directly proportional to the viscosity of the fluid. In the new Houdaille shock absorber the fluid passes through an orifice of very small length, and the flow is then turbulent. In that case the resistance to flow is dependent on the density or specific gravity of the fluid but independent of its viscosity. Therefore, changes in atmospheric temperature and the warming up of the shock absorbers due to fluid friction should have no or, at most, very little effect on their damping action.

On the Continental car, which carries a transverse spring at the front, a single direct-action shock absorber is now used in front. This type of shock absorber, introduced during the past year, is used also on Hudson and Terraplane.

Further improvement has been made in headlighting. Introduction of the flange-fixed focus type of headlight bulb during the past year has permitted of reducing the diameter of the headlamps, and these latter are now made of well streamlined form, the convex lens forming the front of the streamlined body of revolution, and the lamp shell the tail. On several cars in which orthodox body lines have been entirely discarded, such as the Chrysler and DeSoto, the headlamps are sunk into the rounded, wide front end of the body.

Further progress has been made also in means for preventing objectionable glare. This has been accomplished generally in recent years by providing headlamps with two bulbs, one in focus and the other out of focus. The former is used for regular night driving, and the latter, which gives a depressed beam, is switched on when traffic is encountered. In the new Studebakers a somewhat different arrangement is used, the two bulbs being located side by side. When the bulb which is out of

All parts exposed to the air current are streamlined as illustrated by the lamps and hood louvers in (Pontiac)



focus is switched on, instead of the beam being lowered, it is thrown to the right, away from oncoming traffic. These Studebaker headlamps also have an additional, vertical control, actuated by means of a button on the dash, which, through the agency of a magnetic ratchet mechanism, lowers the beam from 1 deg. above the horizontal to several degrees below. The latter beam is used for city driving.

Dimming by a foot control is used on the Pontiac, and the same switch operates fender indicator lights which are thus automatically turned on whenever the headlamps are dimmed.

Streamlining

In body styles the tendency is entirely toward more pronounced streamlining. Some designers have gone a little ways, others quite far in this direction. The most radical step in body design undoubtedly is that taken in the DeSoto and Chrysler in which the engine housing is made part of the body and the whole structure is built up on a very rigid framework which acts as a truss extending between the front and rear axles, carrying the spring-supported mass. This is evidently the simplest way to obtain a rigid structure, capable of withstanding road shocks without serious deformation. It would seem to render the engine somewhat less accessible, however. Abroad engineers have been working on designs in which all chassis parts are carried directly on the body framework, the chassis frame being eliminated, but such a construction evidently is not well suited to quantity production. The Chrysler design, by retaining the chassis frame, takes account of production requirements and at the same time offers the possibility of obtaining extreme rigidity with comparatively little weight.

A streamlined body naturally must be blunt in front and taper toward the rear. In the conventional car of today the "trough" between the front fender and the hood evidently is the cause of considerable air turbulence when the car is being driven at high speed, and in most of the latest streamline designs this trough is either eliminated, the fenders merging directly into the hood or its equivalent, or else its depth is materially reduced. The necessary gradual decrease in section at the rear is achieved by means of a downward slope from the roof. This leaves considerable space back of the rear seat which can be used for luggage purposes.

Several cars now have spare wheels mounted in recesses pressed in the rear body panels. To further carry

out the streamline effect, rear-wheel shields, covering the upper half of the rear-wheel housings, are provided on a number of cars.

Where the space inside the body back of the rear seat is not being used for luggage purposes, a trunk is now sometimes built as an integral part of the body, as in Studebakers and Oldsmobiles. Fender skirts are now practically universal. All protuberances from the body, such as door hinges, door handles, hood latches, etc., are designed with a view to minimum air resistance. In the case of door hinges where streamlining possibilities are rather limited, they are sunk into the body as far as possible. Door handles are given a streamline form with horizontal axis when in the normal, locked position. Even the hood doors, following the example of Oldsmobile, are given streamline forms, being made of die castings, etc., set into openings stamped in the hoods. Bumpers are being given rather fanciful shapes to harmonize with the rest of the exterior. On the Nash, "speed ribbons" pressed into the top surface of the hood and the fender skirts convey an impression of fleetness.

A new type of seat, with exposed, chromium-plated tubular steel framing, has been introduced on the Chrysler and DeSoto lines. Permitting of free air circulation along the floor, it will promote the equalization of temperatures in the front and rear compartments, and it undoubtedly makes a relatively strong and light seat.

Body Ventilation

Following the introduction of its new ventilating system by Fisher Body Corporation last year, much attention was devoted to the problem of body ventilation, and almost every manufacturer has something new along this line this year. The original Fisher system has been improved in a number of ways. For one thing, triangular drip moldings are provided over the front doors, which prevent rain entering the front compartment when the car is being driven in a rain with the ventilators swung outward. Fishers also have introduced a new type of cowl ventilator this year. In the past, all cowl ventilators opened toward the front, with the idea of scooping up air as a result of the forward motion of the car. In the new Fisher ventilator air deflected by the windshield is forced through the ventilator. In cars having the Fisher body-ventilating system, the windshield is fixed in place, so that the relation between cowl ventilator and windshield remains unaltered.



Arm rest at driver's seat (Fisher body)



Chevrolet Stake Body on New Truck Chassis

Detail Improvements More Load Space and

by Athel F. Denham

Detroit Editor, Automotive Industries

CHEVROLET'S 1934 commercial cars and 131-in. and 157-in. wheelbase trucks depart more than formerly from passenger car practice.

The wheelbase of the half-ton truck has been increased to 112 in. and the allowable gross weight to 4400 lb. The new model has a specially designed truck frame of 11 $\frac{1}{4}$ in. greater overall length. The engine has been moved forward almost 4 in. for improved load distribution, the dash having been moved forward 3 $\frac{1}{2}$ in. As a result, there is approximately 7 in. more seating and loading space ahead of the rear axle.

One-Half Ton Model

Frame design has been revised with a view to greater torsional rigidity. The rear cross-member is composed of two "Z" sections riveted to upper and lower side rail flanges, and tied together by longitudinal braces supporting the gasoline tank. As compared with 1933 commercial cars, the frame side rails are from $\frac{1}{4}$ in. to 1- $\frac{3}{32}$ in. deeper, and the cross members are made of heavier material.

To take care of the increased load capacity, the rear springs are made stiffer; they are spaced 1 $\frac{1}{2}$ in. further apart, for increased stability and are more nearly parallel. Front springs now are shackled at the front end. Spring shackles are of the threaded bolt and bushing type.

Front axles have a stronger center section. King pin bosses are solid over their entire length.

Wider spacing of the rear springs has reduced the load on rear-axle bearings and housing. Propeller shafts are now tubular and larger in diameter, reducing weight and the tendency to whip. At the front end of the torque tube a hard bronze bushing is provided to bear on the shank of the universal joint yoke.

Steering gear pitman arms are interchangeable with those used on the 1 $\frac{1}{2}$ -ton trucks.

Brakes are now of the double articulated-shoe type, with both upper and lower shoes swinging on links pivoted at the anchor plates, providing more efficient use of brake-shoe length. In addition, the length of the lower shoe has been increased, and the total braking area is now 170.2 sq. in. Stamped-steel dust shields have been added to the backing plate.

While the engine displacement has not been changed, the horsepower output has been increased, due principally to improved head design, increased valve lift, and larger valves. The maximum horsepower is now 60 at 3000 r.p.m., as compared with 56 at 2750 r.p.m.

Pistons have been provided with increased bearing area. Pins are tempered after carburizing, to relieve heat-treating strains, and prevent shrinkage under operating temperatures. Compression rings are narrower, for quicker breaking-in, and located lower on the piston.

The diameter of the camshaft has been increased for greater rigidity. A longer ramp on the exhaust cam permits setting the tappet clearance at .13 in. when hot.

Both inlet and exhaust valves and their ports are larger, as shown by the specifications. The improved combustion chamber permits of the use of a higher compression ratio (5.45 to 1). Spark plugs have been re-located for better firing conditions, being close to the exhaust valves, and at an angle.

For longer valve life, eight small stamped copper nozzles are pressed into the lower wall of the cylinder head close to the exhaust-valve seat walls, directing streams of cooling water at these points.

Valve stems are 1/32 in. larger in diameter and valve springs exert slightly greater pressure with the valve open, but materially less with the valve closed, which tends to increase valve-seat life by reducing the seat pounding.

An additional spring, which seats on

a collar at the lower end of the push rod of the overhead valve mechanism, its upper end bearing against a retainer bolted to the crankcase ledge, keeps push rod, tappet, and cam in contact and makes for greater quietness of the valve mechanism.

The larger valves with their increased angularity, required a new rocker arm design. The rocker-arm ratio was increased to obtain the greater valve-lift desired.

In the manifolds the inlet port sleeves have been eliminated, and a counterweight has been added to the heat control mechanism, to prevent rattling.

The downdraft carburetors have smaller venturis, increasing the velocity of the air through the throat, for better atomization of fuel. Bakelite disks are used for check valves in the accelerating-pump.

The starter ratio has been increased to 14.6 to one, for easier cranking in cold weather.

Radiators are now seamed at the sides to the radiator-support member. The brass core is now of the ribbed cellular type, as used on the 1933 passenger cars. It provides 18 per cent more cooling capacity per square foot of frontal area.

Tires are larger in section, and mounted on smaller wheels with wider rims.

1 $\frac{1}{2}$ Ton Trucks

All of the power plant improvements mentioned for the $\frac{1}{2}$ -ton line apply equally to the 1 $\frac{1}{2}$ -ton chassis. This includes engine accessories and radiator, except that the latter has a copper core.

In addition, the truck line has a new clutch, with a cushioned hub. The clutch cover is stamped, with a circular reinforcing rib pressed into its inner edge and secured to the flywheel by nine bolts. Drive is taken by posts cast on the pressure plate, contacting broached edges of holes in the clutch cover. This is said to permit more ac-

Give 1934 Chevrolet Truck Line Greater Power and Durability

curate centering than the previous radial drive pins. The clutch is 10 in. in diameter and is said to require less pedal pressure and to have longer life.

Transmissions on the 1½-ton line are substantially unchanged. Gear-shift lever balls are now hard rubber, with a soft rubber core to prevent "telephoning" of transmission vibrations. Both the 1½-ton trucks have propeller shaft extensions now, with a universal joint at each end. The extension can be removed to make room for an auxiliary transmission or other accessory, if desired. The change also permits dropping the propeller shaft as a unit, making it unnecessary to pull the axle to remove the transmission from the chassis.

Rear-axle shafts have been increased in diameter at the bearing end. The wheel bearing is now of the double-row ball type, reducing the load on the balls.

Front brakes on the 1½-tonner follow the lines of the new commercial models. Their braking area is now 204.8 sq. in. The cut-in system of applying the service brakes by the

parking-brake lever has been adopted on the 1½-ton model also.

Both 1½-ton chassis models use the same front springs, the number of leaves in the 131-in. model front spring having been increased. They are now shackled at the front, threaded bolts and bushings being used.

Frames of both models are entirely new. They are higher from the ground for increased ground and torque-tube clearance, which is important particularly for construction, road building and farm haulage. The body loading height has not been changed, however. Kick-up over the rear axle has been eliminated.

As on the commercial line, the engines have been shifted forward 3 in. for better load distribution, and the dash moved ahead 2¼ in.

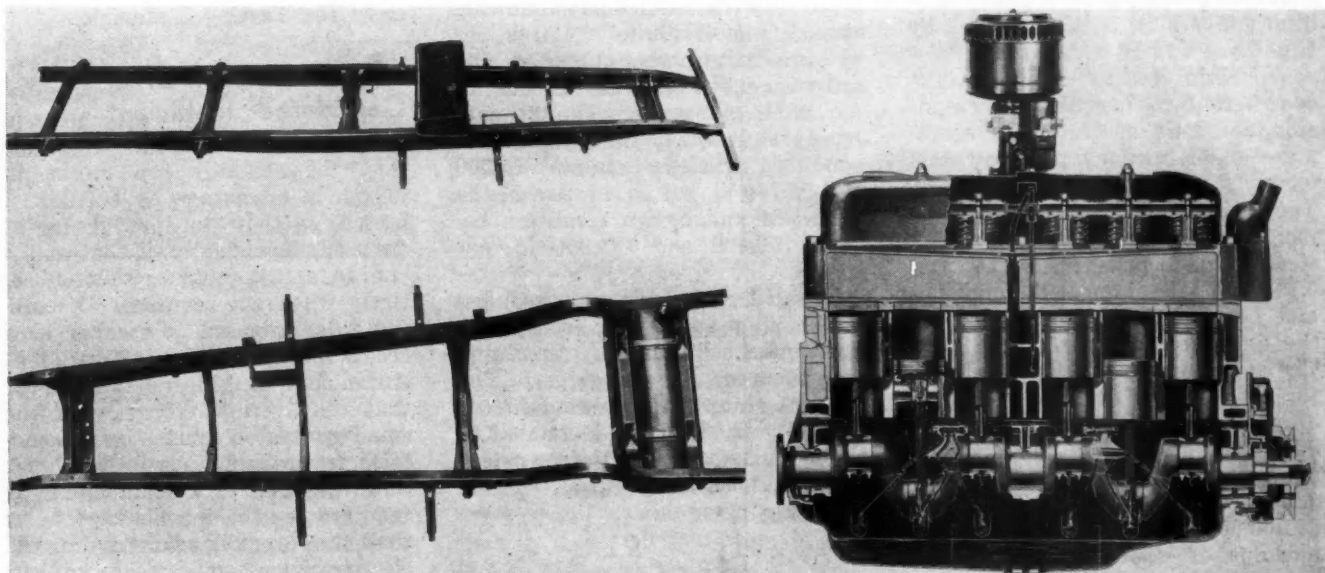
Side rails are deeper on the 131-in. model. Both models have wider side-rail flanges at the front end, at the front cross-member, and back of the rear axle. The front cross-member is now a single steel stamping of increased rigidity. It is similar to the design used on the 1933 passenger

car line. The second and third cross-members are similar in design to the second member as used on the commercial chassis. On the 157-in. chassis the fourth member is also of this type, depressed at the center for mounting the front propeller shaft assembly. Rear cross-members are of channel section, with gusseting brackets to side-rail flanges.

Cabs

Driver comfort has been increased by increasing all dimensions of the cabs which are 2 in. longer, 4¾ in. wider, and 1¼ in. higher above the sill. The passenger-car type of drop sill construction is now used, permitting doors to overlap sills and provide a better seal against drafts. Door openings are wider at the bottom.

The front of the cowl slopes at the same angle as the hinge pillars and windshield, improving appearance. Steel roofs are one-piece stampings, including the visor and drip moldings. Anti-theft door locks are provided, door handles turning free when locked, returning automatically to a



(Upper left) Both the 131 in. and 157 in. frames are entirely new with kick-up over rear axle eliminated. (Lower left) Standard commercial chassis frame has been improved in detail. (Below) Improvements raise engine rating to 60 hp. at 3000 rpm.

horizontal position. Windshields are sloped.

Bodies

Bodies also have undergone considerable refinement. Pick-up boxes are longer, wider and higher, with rolled edge panels. Attachment to chassis, and fenders to box are more rigid. There are six body bolts instead of four.

The 157-in. stake body is made of three side sections instead of four and has a wider sign board.

Platform bodies and farm models remain unchanged. In the panel

bodies side panels have been dropped with relation to the platform, for better appearance. The rear-quarter section has been eliminated. The main body of this panel is a one-piece stamping, heavy gage wheel housing spot-welded on. Sponge-rubber gaskets are provided between side panel and roof rail, and between inner side panel and wheel housing. A visor is formed in the front roof panel. Cowl and dash assemblies are more rigid, and with sloping lines, the design being similar to that used on passenger cars. Front doors are wider, and

hung on three hinges. They extend below the sill line. The rear-body panel carries out the beaver tail design. Rear doors are 4½ in. wider, for easier loading. Door height on the commercial chassis is 3 in. greater.

End gates on canopy express bodies are mounted on a piano-type hinge, and have a center-type lock handle with extension rods to the two snap-type lock bolts. The partition panel is of heavier gage for driver protection against shifting of load. On the canopy express the seats are now of the same type as on the panel body.

New Chevrolet Truck Specifications

	Commercial 131 in.	157 in.
Wheelbase	112 in.	n. c.
Siderail thickness	7/32	7/32
Depth, center	5¾	7
Depth, front	4¾	n. c.
Min. engine clearance	11 9/16	15 7/16
Transmission clearance	11¾	14¾
Gross allowable weight..		
(30 x 5 duals)	none	9300
32 x 6 singles	none	7600
5.50/17	4400	none
Rear-axle wheel bearing n. c.	n. c.	double row
Width	n. c.	15¾
Retention	n. c.	nut
Dist. bet. spring seats ..	41 in.	n. c.
Prop.-shaft type	tubular	n. c.
Braking area	170.2	204.8
Parking brake operation ..	n. c.	cut-in
Rear-brake connection ..	cables	n. c.

(n. c. indicates no change)

	Commercial 131 in.	157 in.
Tires, section	5.50	n. c.
Wheel diameter	17	n. c.
Rim width	3.62	n. c.

Engine Specifications—all Models

Maximum horsepower	60 at 3000 r.p.m.
Compression ratio	5.45 to one
Camshaft diameter	1¾ in.
Exhaust valve clearance, hot .....	.013 in.
Valve-head diameter:	
Inlet	1 41/64
Exhaust	1 15/32
Valve springs, load: valve closed	45 lb.
Compression ring width	¾ in.
Fan diameter	16¾ in.
Starter ratio	14.6 to one

Mechanical Properties of Alloy Steels

ACCORDING to the results of an investigation conducted at the Fritz Engineering Laboratory, Lehigh University, Bethlehem, Pa., by Inge Lyse and H. J. Godfrey, Poisson's ratio (ratio of transverse contraction to longitudinal extension per unit of length in specimens under tension) for alloy steel varies between 0.272 and 0.320. The ratio of yield point in shear to yield point in tension for alloy steel varied between 0.774 and 0.894 for the annealed condition and between 0.662 and 0.809 for the quenched-and-drawn condition. The modulus of elasticity in tension for alloy steel in the annealed condition varied from 27,500,000 to 30,000,000 lb. per sq. in. and for alloy steel in the quenched and drawn condition from 28,200,000 to 30,000,000 lb. per sq. in. The modulus of elasticity in shear in the annealed condition varied from 11,320,000 to 12,700,000 lb. per sq. in. and in the quenched and drawn conditions from 11,660,000 to 12,-

500,000 lb. per sq. in. The ultimate strength in tension of alloy steel in the annealed condition varied from 67,400 to 96,150 lb. per sq. in. and in the quenched and drawn condition from 91,100 to 157,500 lb. per sq. in. The ultimate strength in shear in the annealed condition varied between 75,900 and 95,750 lb. per sq. in. and in the quenched and drawn condition between 90,600 and 134,950 lb. per sq. in.

Ten different steels were included in the alloy specimens, incorporating nickel, chromium, vanadium, molybdenum and tungsten. The authors state that the modulus of elasticity in shear, G , is related to the modulus of elasticity in tension, E , and Poisson's ratio, μ , by the following formula:

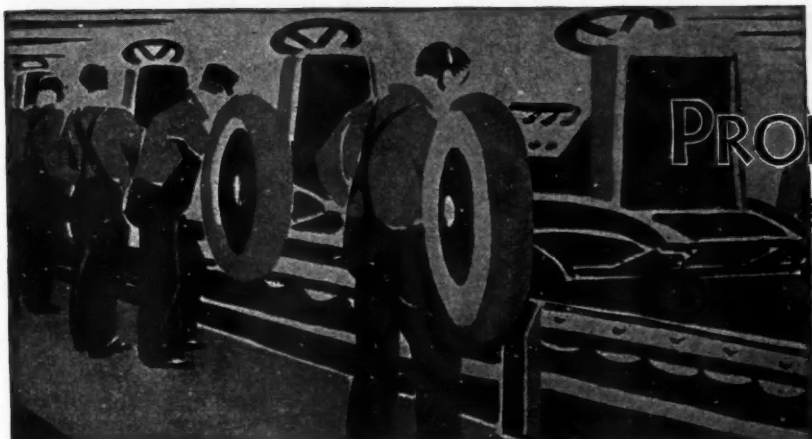
$$G = \frac{E}{2(1 + \mu)}$$

which, however, holds only in the case of homogenous, isotropic materials.

The results of this investigation are given in detail in a paper entitled "Shearing Properties and Poisson's Ratio of Structural and Alloy Steels," contributed to a recent meeting of the American Society for Testing Materials.

Independent Fan Drive Considered Inefficient

It has been repeatedly suggested that the radiator fan might be driven to advantage by an electric motor, so that its speed could be varied independently of that of the engine, and it could be shut off entirely when not required. Discussing this proposed, a speaker at a recent meeting of the Institution of Automobile Engineers pointed out that the average efficiency of the small generator carried on automobiles is probably not over 30 per cent, and that of a small motor as required for the fan also is low, so that the over-all efficiency of the electric drive would be very low; and since considerable power is required for driving the fans on the more powerful cars, the proposition is not so attractive.



PRODUCTION LINES

Clear It

Either the Supreme Court or some other power will have to clarify three terms cropping up in current labor-employer disputes. What is meant by union "recognition?" It used to mean "closed shop" in common parlance. But what is it under the NRA where the closed shop agreement is ostensibly taboo? When is a strike? Does a strike mean a walkout of a minority group or does it imply a complete paralysis of the plant. The answer to this will answer the third query: when is a lockout? If a minority walks out and is readily replaced by willing workers, has the group been locked out? Common sense and precedent seem to have no place in recent interpretations. Some one with authority will have to make new definitions.

Yes and No

Those who say that the NRA program is illegal and unconstitutional are like the lawyer who found his client in prison. "They can't do this to you," he said. "They can't put you in jail for what you've done." "I know they can't," said the prisoner, "but here I am."—*from The Houghton Line.*

Completely Revised

The eighteenth edition of the Handbook of Chemistry and Physics containing 1818 pages of tables and data for engineers and research men is off the press. It is a mine of information with its tables of physical constants and chemical tables of organic and inorganic compounds, and other data on measures and units. In addition

to many changes and revisions, the Handbook features a revised table of physical constants of inorganic compounds, a complete list of elements, and a discussion of isotopes. Published by the Chemical Rubber Publishing Co., it sells for \$6.

Quenching Media

In discussing the problem of quenching media for the hardening of steels, Howard Scott of Westinghouse concludes that: "The best compromise appears to be attained in media which provides a high cooling rate within the steel over the temperature range 600 to 500 C., together with a very low cooling rate below 400 C. This variation of cooling rates reduces distortion considerably and minimizes development of residual stresses. Control of cooling rates below 400 C. is more important the higher the carbon content. There are critical sizes with respect to cracking for each composition of steel and quenching bath. They are best avoided by slow cooling through the hardening transformation, which usually occurs below 400 C."

On Recovery

One of our friends, incidentally well known to many of you, has joined the ranks of those who have a solution for the depression. His plan is interesting although largely satirical. He reasons that if recovery by ukase is to proceed from increased purchasing power, wider credit, and Government subsidy, then let's extend it to every one of our citizens. In its fullest development the plan would permit the Government to print enough money to provide each citizen with about \$6000 per year of steady income.

Supreme Court

National Assn. of Manufacturers in a report just made public, characterizes the National Labor Board as the new Supreme Court of Labor. Set up as an advisory board to hear labor disputes, the NLB on the basis of its recent decisions has assumed the powers of the Court in making its rulings bear the finality of court decisions. For instance the NLB has ruled that representatives of the workers need not necessarily be chosen from the ranks of the workers, thus opening the way for professional labor organizers to deal with employers. This development is an interesting commentary on the "New Deal" and one which may continue to play a pivotal part in labor-employee relations.

Full Steam

An outstanding foundry organization tells us that business is picking up on cast alloy crankshafts. Besides the automobile manufacturers who are experimenting with it, there are also a number of diesel engine builders who are working on the new idea. One of them reports in recent correspondence that they have several large shafts in actual service and despite considerable abuse the shafts show no wear, the journals and crankpins taking on a hard polish.

On Quenching

The Research Staff is just out with another of its splendid contributions, this one being, Houghton on Quenching. This treatise is a profusely illustrated discussion of the role of quenching in heat treatment with test data concerning the performance of commonly-used quenching media. Well worth a reading by engineers and metallurgists.—J. G.



NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

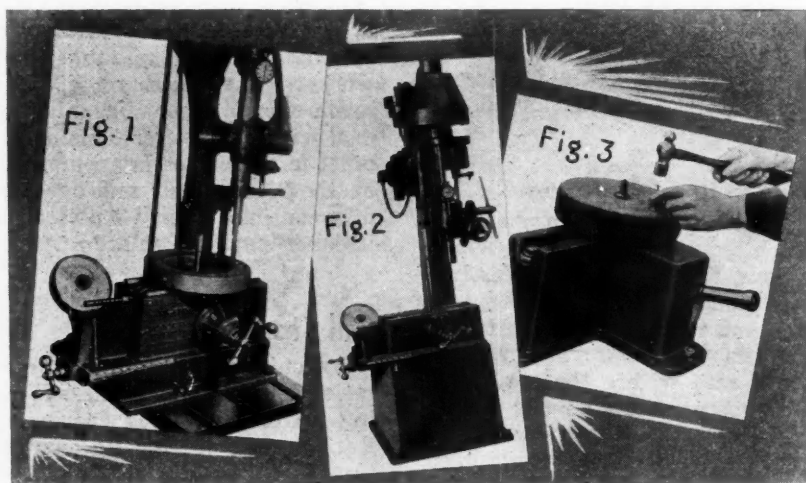
Universal Static Balancer of Exceptional Accuracy

"Hi-Eff" static balancers now are being offered by the Taylor Mfg. Corp., Milwaukee, Wis., for the balancing of flywheels, pulleys, pump impellers, gears, etc.

These balancers are universal in their use by enabling the balancing of various shaped or sized parts in

ically record the exact amount of inch ounce unbalance in the part being weighed. After the amount of unbalance has been determined, the usual delay in calculating the number of holes to be drilled and their depth is automatically done away with on the automatic calculator shown on the left of the machine in Fig. 1.

In operating this balancer, the part



Hi-Eff Static Balancers made by Taylor Mfg. Co.

quick rotation without a change in set-up. All this can be accurately and rapidly done on one "Hi-Eff" balancer, the only adjustment required being a turn or two (by the fingers) of the threaded portion of the centering spindle. This adjusts the weighing fulcrum to the center of gravity of the part to be balanced.

It is claimed that unbalance can be corrected as close as 0.01 inch ounce on the smaller models to 0.1 inch ounce on the largest. These balancers are built in standard models to handle parts as light as one ounce and as small as one inch outside diameter to larger sizes which will balance parts up to 48-inch diameter and weighing up to 600 lbs.

Speed in production is obtained through a number of features. The locating of the heavy spot is almost instantaneous through the use of a very sensitive spirit level. The weighing of the unbalance is accomplished either by a hand-operated weighing beam or through an automatic weighing dial, the latter taking but a few seconds to automat-

ically record the exact amount of inch ounce unbalance in the part being weighed. After the amount of unbalance has been determined, the usual delay in calculating the number of holes to be drilled and their depth is automatically done away with on the automatic calculator shown on the left of the machine in Fig. 1.

is placed onto the base with the centering spindle through the bore of the part. For various shapes and sizes of bores, bushings are provided. A turn of the right ball crank lifts the part into balancing position, the heavy spot tilts the part, the bubble in the spirit level goes to the opposite side. The heavy side is then swung on the cradle to opposite the weighing beam and the unbalance is weighed in inch ounces or decimals thereof. By turning the left ball crank the part is moved so that the drill will come directly over the spot where the excess material is to be removed. The calculator has moved with the base all this time and the operator reads direct the number of holes to drill at the selected radius and their depth in thousandths of an inch.

In addition to the models which can be used on any available drill press, production line models are built with integral base and drill head as shown in Fig. 2.

Fig. 3 illustrates a model developed primarily for the balancing of pol-

ishing wheels, where the unbalance is compensated for by nailing lead slugs onto the side of the wheel. No weighing beam is used in this type balancer. The method of mounting the wheel to be balanced is similar as for other work and after the heavy spot has been brought adjacent to the spirit level a lead slug is placed opposite and moved around until the spirit level shows a satisfactory balance. The slug is then nailed on.

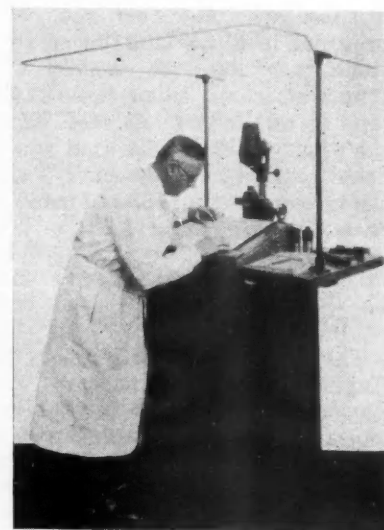
Desk Type Profile Projector

A new form of projector of the profile of various types of small articles for checking purposes has been offered recently by the Société Genevoise d'Instruments de Physique, and is being marketed in the United States and Canada by their American agents, The R. Y. Ferner Co., Investment Building, Washington, D. C. It differs from other profile projectors in that the image is thrown from below onto the upper surface of a heavy glass plate set in the top of a steel cabinet. The plate is inclined at an angle of 15°, so that the operator can look directly at the projection.

This construction and the convenience of mounting many small articles on a small table below the projecting condenser adapts the equipment to a wide variety of uses. In addition to the comparison of the profile of screw threads and gears with the theoretical cross section, it can be used for checking cutting tools, profile cutters, screw rolling dies and milling cutters.

For photographing the image, a blue filter is furnished to replace the green filter regularly used to relieve eyestrain in direct observation of the table. An exposure of 15 seconds is all that is required with the lamp furnished and the recommended photographic plates.

Tracing paper or cloth laid on the glass panel of the table reveals the



Profile projector marketed by R. Y. Ferner Co.

image with enough sharpness so that 0.005 or 0.01 inch can be measured, which, with 100 × magnification, for example, corresponds to 0.00005 or 0.0001 inch on the object. Glass scales of several lengths and graduated to 50ths of an inch, or to 0.005 in. for use with a magnifying glass, are furnished for checking purposes. An excentrable diaphragm for the condenser to give oblique illumination can also be obtained with the accessories.

Objects as large as $\frac{1}{8}$ in. x $\frac{5}{32}$ in. can be tested with the objective giving 100 magnification. With 50 magnification the dimensions of the object may be twice as great and with 20 × they may be $\frac{1}{4}$ in. x $\frac{25}{32}$ in. Objects as large as $1\frac{1}{4}$ in. x 19-16 in. can be magnified to 10 times on the screen.

The equipment occupies floor spaces only 3 ft. 9 in. x 4 ft. and is 6 ft. 2 in. high. Net weight is 414 lbs.

Two Machines For Automotive Work

Two production machines of particular interest to automotive plants have been placed on the market by the Norton Co., Worcester, Mass.

The D-85 crankpin grinder is a large, powerful machine, with a swing of 17 in. and built in two lengths, 28 in. to 40 in. and 40 in. to 52 in. It uses the same wheel unit supplied with 20-in. and larger Type D roll grinders. The wheel spindle bearings are flood lubricated and the wheel-slide ways forced-feed lubricated with filtered oil. The unit mounts a 42-in. diameter grinding wheel as standard and weighs over 3300 lbs. complete with slide-mounted motor.

The machine requires two driving motors; one drives the grinding wheel directly by vee belts while the other within the base drives the work from one end and the pumps (coolant and oil) from the other.

The machine is of the double-head type, both heads driving the crankshaft. An adjustment for synchronization of the heads is provided. The left head is fixed longitudinally, but has a lateral adjustment, while the right head is fixed laterally, but is adjustable longitudinally. This design makes a more flexible arrangement and simplifies the retooling problem when changing models. Both work head spindles run in long, large diameter bronze boxes.

The wheel head traverse and feed, the table travel and the opening of the work holder clamps are all hydraulically operated, the various levers being directly under the operator's left hand as he stands in operating position before the machine.

The machine is regularly equipped with some form of grinding gage, the choice resting with the customer. It can also be equipped with the Nortonizer if desired.

NEW DEVELOPMENTS

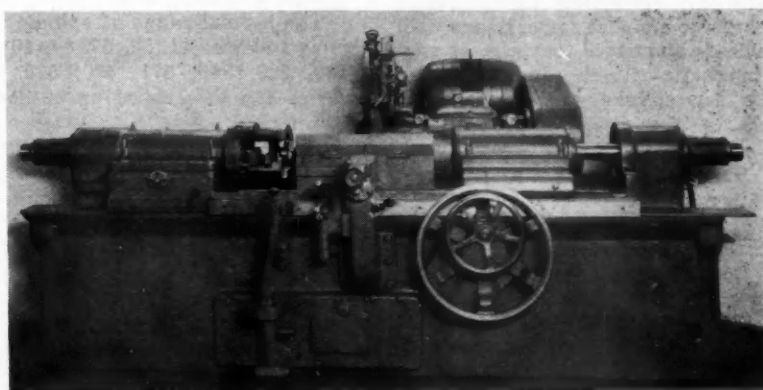
Automotive Parts, Accessories and Production Tools

Two types of steadyrests are offered. One, known as the elevating type, swings up clear of the work, facilitating loading and unloading. The other, known as the fixed type, is permanently attached to the base and is hydraulically operated. The shoe leaves the work automatically when the wheel-head recedes.

The shorter length weighs approximately 16,000 lbs. with motors and requires a floor space about eight feet wide by 15 feet long.

quently the cam being ground, is raised and lowered.

Upon moving the starting lever, the table moves over quickly until the first cam is in grinding position, the work starts rotating, the rocking bar lowers, the grinding wheel feeds in rapidly and then slows down automatically to a grinding feed. When the cam is ground to size, the wheel moves back quickly and the table shifts, bringing the next cam into the grinding position and moving the



Norton crankpin grinder

The Cam-O-Matic, the second machine, is in no sense an attachment for a standard grinder. It is a highly specialized tool for grinding automotive camshafts on a quantity production basis. It uses a Type C wheel unit with flood-lubricated spindle bearings, forced-feed lubricated wheel-slide ways and mounted motor. The machine can be used for either roughing or finishing.

The Cam-O-Matic has a maximum swing of 6 in. diameter over the rocking bar and is built in three standard lengths, taking 30 in., 36 in. and 42 in. between centers. Cams with a maximum lift of $\frac{3}{4}$ in. can be ground and when the wheel slide is withdrawn a 24-in. wheel will clear a $3\frac{1}{4}$ -in. diameter bearing or gear between cams. Master cams are furnished for either 24 in. or 22-in. wheels.

In principle, the machine is similar to the Norton integral cam grinding attachment. There is a master cam for each product cam and it rotates in contact with a master cam roller. The master cams and the work are supported by a rocking bar and as the master revolves in contact with the roller the rocking bar, and conse-

quently the cam being ground, is raised and lowered.

The machine with motors weighs approximately 13,000 lbs. and requires a floor space about 6 x $13\frac{1}{2}$ feet.

Signals Right and Left Turns

Neon-Arrowlite, Inc., Los Angeles, Cal., has brought out a semi-automatic neon-tube signal lamp to indicate right and left turns. It is controlled by an automatic switch mounted on the steering column, so arranged that the switch lever is moved before turning to signify direction, the signal being automatically cut off when the turn is made.

Four types of installations are available: De Luxe Type No. 1, consisting of both left and right hand turn signals, both controlled from one switch. The same switch operates either the left unit alone or right and left units combined. This installation includes four lamps—one on each fender. De Luxe Type No. 2 for left turn signals only, consisting of two lamps—one each for front and rear left fenders. Also two standard types.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Magna-Matic Full Automatic Lathe

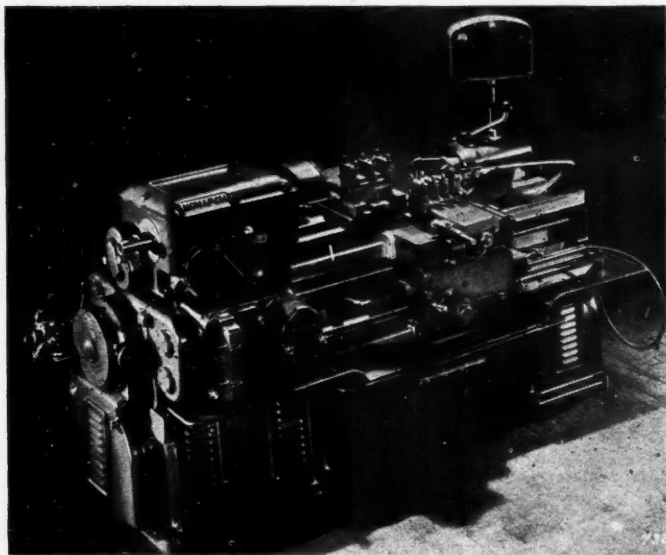
The Monarch Machine Tool Company, Sidney, Ohio, has just announced the Magna-Matic Full Automatic Lathe, which is said to provide simpler and quicker means of changing from one job to another—making it especially adaptable to small-lot production as well as to long-run production.

The lathe is electrically controlled throughout, employing the principle of magnetic clutches for carriage, tool slide feeds and rapid traverse, as well as magnetic clutch and magnetic brake for spindle operation. Limit

front carriage apron, makes it possible to instantly reverse the cycle of the front carriage tool slide—making it equally adaptable to “out-facing operations” and “in-feeding operations.”

The rear carriage is positioned manually at any point along the bed. The rear carriage tool slide is controlled automatically by two magnet clutches contained in the rear gear box. They provide “in-feed” for facing or necking operations and “out-rapid-traverse-return.”

The normal range of spindle speeds is as follows: 41, 52, 67, 84, 108, 138, 180, 229, 296, 371, 480, 610. This range can be stepped up or down as



Monarch Magna-Matic Automatic Lathe

switches are said to accurately control diameters and lengths of cut. No cams are used whatsoever in the operation of the Magna-Matic lathe. There are four magnetic clutches in the front gear box; two provide length feed and rapid traverse return to the front carriage, the other two, through the feed rod and simplified gearing in the apron, provide “in-feed” and “out-rapid-traverse” movement or “in-rapid-traverse” and “out-feed” movement to the front carriage tool slide. A reverse lever, on the

desired, either through the speed of the main driving motor located in the headstock cabinet leg, or by changing the diameter of the multiple Vee belt sheave pulley on the motor. The spindle may be safely operated at 1500 r.p.m.

The tailstock spindle has an anti-friction built-in tailstock center. One lever both positions and clamps the tailstock spindle. The front carriage and tool slide are so arranged as to pass the tailstock. The master control switch, shown in the elevated

position at the tailstock end of the lathe, gives complete electric control for both set-up and full automatic operation of the machine.

In changing from one job to another, it is merely necessary, in addition to changing the tool set-up, to set micrometer stop dogs for “in” and “out” front tool slide diameter and for front carriage “length travel,” and for rear carriage “in” and “out” feed travel.

This lathe may also be operated to turn various diameters and lengths, when desired, by means of a single-point tool on the front carriage. All tool movements are controlled by means of a convenient template, which can be made of steel from 1/16-in. to 1/8-in. thick. A two-way electrical contactor switch makes contact with the template and will reproduce the shape of the work on a production basis to a degree of accuracy better than 0.001 in. Tools in the rear carriage tool slide can be used for facing and necking simultaneously, being timed to perform their work at any point desired in the front carriage tool cycle.

The Monarch Magna-Matic can be equipped with the automatic feed step-up, for the front carriage travel. This is a simple electrical control mechanism permitting the automatic selection of the desired feeding rate on as many as four different diameters of a shaft or piece of work.

Main driving motor, ranging from 5 to 10 hp., 1150 r.p.m. (either AC or DC current), is dependent on the work to be produced. To operate the magnet clutches, approximately 1 kw. of 115-volt DC current is required. The limit switches and relays operate on 14-volt current, thus avoiding all tendency of arcing in the switches. The net weight of the machine is 4700 pounds, shipping weight 5200 pounds, boxed weight 5700 pounds. Overall floor space of machine taking 18 in. between centers is 47 in. x 84 in.

The New Sundstrand Hydraulic Pump

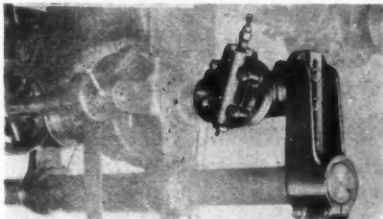
A small-capacity, high-pressure rotary pump with positive displacement has just been introduced by the Sundstrand Machine Tool Company, Rockford, Ill. It is designed for pumping water, oil and other fluids at high pressures.

The pumping members comprise a rotor and roller which revolve with each other in a manner similar to a single roller rolling with the outer race of a roller bearing. A new feature is the mounting of all revolving parts in roller or needle bearings, which greatly increases the mechanical efficiency. High volumetric efficiency is also developed due to the self-emptying feature of the pumping members.

The pump is built to run at motor speeds and at present is available in two sizes, the capacities being one and two gallons per minute at 1725 r.p.m. Rota-Roll pumps of larger displacement will be ready in the near future.

High Speed Milling Attachment

A high-speed universal attachment for power feed milling machines has been brought out by The Porter-Cable Machine Co., Syracuse,



Porter-Cable universal milling attachment

N. Y. It is said to be useful in tool room, jobbing shops, and manufacturing plants for jobs such as: milling internal or external cams; boring holes in jigs and fixtures without changing position of work; milling drafts on patterns; also radius, angular, T-slotting and experimental work.

The universal head of the attachment, operating as it may at any angle in any plane, is said to simplify intricate milling, reduce set-ups and do work now being done by hand. Regardless of the position of the cutter, the attachment is held rigidly by the overarm clamp. It is driven by the spindle of the milling machine, providing a spindle speed of 21-3 times the speed of the milling machine spindle. Adaptable to any make of single or double overarm milling machine, it is furnished with either No. 9, 10 or 11 B & S taper drive arbor. The spindle of the attachment itself has a No. 7 B & S taper for milling cutters of any description. For holding small end mills, a split draw-in collect can also be furnished.

Weight of attachment without supporting clamp, 48 lbs. Weight of clamp, 25 lbs.

Noise Deadening Compound

The Monroe Auto Equipment Company, Monroe, Mich., announces the perfection of a new compound to be used in deadening body and door panels.

This material, known as Spraytex,

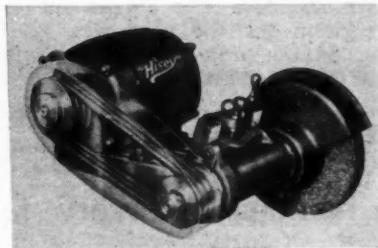
NEW DEVELOPMENTS

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was developed for Monroe by the Insulation Development Company and is said to have been approved by several automobile manufacturers. It is claimed that Spraytex is easily and rapidly applied and does not scale off or deteriorate. Officials state that it is much lighter in weight when applied than certain other compounds made for deadening purposes.

Works In Wide Range

The Hisey-Wolf Machine Co., Cincinnati, Ohio, is offering a new line of grinders for a wide range of work. These units are made in four sizes ranging from $\frac{1}{2}$ to 5 hp. drive, depending upon wheel size. They are readily adaptable for lathe, boring



Hisey-Wolf grinder

mill, planer, milling machine, etc., and permit the use of any shaped grinding wheel. Although indispensable for many odd grinding jobs which crop up in every shop, they are said to be equally suited for production work, being constructed throughout for heavy and continuous duty.

These grinders are equipped with constant-speed motors which operate at practically the same speed under any load within their rated capacity. Due to compact design, these grinders are said to detract very little from the capacity of the machine tool on which they are mounted. On most lathes any roll can be ground which can be swung over the carriage. The grinding spindle, together with the motor, can be swung end for end so that grinding can be done either to the right as pictured or to the left of the machine. Direction of rotation of the wheel is reversible through the motor.

Grinder for Light Work

The 6x18 surface grinder just announced by the Norton Co., Worcester, Mass., is an hydraulically operated machine with automatic cross feed developed for tool and die shops or for light production jobs. It is motor-driven, completely self-contained and equipped to take either a plain bronze or ball bearing cartridge type spindle. The spindle mounts an 8 in. x $\frac{3}{4}$ in. grinding wheel, has a positive end thrust, and is driven by vee belts direct from the motor, which is mounted on a platform on the vertical slide. If desired, an integral motor and spindle design is available.

The hydraulic system is of the low pressure type, the pump and its driving motor being an integral unit mounted inside a front cover plate. A simple piston type reverse valve is used and the table is propelled by a double-rod piston connected at each end and traveling in a cylinder attached to the saddle. Starting, stopping and speed of the table are all controlled by a single throttle valve.

The automatic cross-feed functions at each reversal or at alternating reversals and is adjustable from .010 in. to .090 in. It stops automatically upon completing a traverse in either direction. Simultaneously, the table stops in the loading position.

Without motor and magnetic chuck the machine weighs approximately 1700 lbs. and requires a floor space about four by six feet.



Norton surface grinder

900 Attend S.A.E. Annual Banquet

Roos Is President-Elect; Kennedy, Ket and Willemse Speak

NEW YORK—With an attendance of more than 900, the S. A. E. staged one of the best annual banquets in its history on Wednesday of Show week.

Formal announcement was made of the election of Delmar G. Roos, Studebaker chief engineer, as president of the society. In a short speech, Mr. Roos pledged his best efforts and bespoke the cooperation of the membership. In a humorous vein, he said: "I wonder what we are going to call these cars when we really get them streamlined. Probably we'll have to have a philological department in the S.A.E."

C. F. Kettering was scheduled to be toastmaster but was able to stay only long enough to make a short and characteristic talk. He drew a roar from the crowd when he admitted that "the engineers have really done something this year," and then followed it up with "the public will tell them what this time next year."

C. B. Whittelsey acted as toastmaster following Mr. Kettering's departure. He introduced the distinguished guests including 16 past presidents, President Dickinson, who made a short talk, and President-elect Roos. The speakers of the evening were John B. Kennedy of broadcasting fame and Capt. C. W. Willemse, formerly of the N. Y. Police Department.

At the same time Mr. Roos' election was revealed, the election of other nominees was announced. The new vice-presidents are T. P. Wright, aircraft; Robert Insley, aircraft engines; H. D. Hill, Diesel engines; A. L. Clayden, fuels and lubricants; A. K. Brumbaugh, trucks and motor-coaches; F. F. Kishline, passenger cars; John W. Votypka, passenger car bodies; W. H. McCoy, production; and L. V. Newton, transportation and maintenance. J. M. Crawford, J. B. Fisher and J. F. Winchester were elected to the council for 1934-1935. D. Beecroft was named treasurer.

Studebaker Adds Special Dictator Models at \$665

NEW YORK—A Dictator Special series with a coupe at \$665 and a sedan at \$715 is being added to the Studebaker line. In general the cars in this new series will be the same as the standard Dictator models but will not be equipped with free-wheeling, startix, and some other items.

Studebaker also revealed two new body models on the President chassis at the Show—a "Land Cruiser" and a berline. The former is a close coupled four-door sedan with streamlined tail

and lists at \$1,395. The baggage compartment in the tail, Studebaker Sales Corp. president Paul Hoffman says, is big enough to carry two stowaways comfortably. The berline is priced at \$1,345 and is finished with unusually fine upholstery. It is featured by a sliding glass partition separating the front and rear compartments.

NACC Output 1,491,305

Preliminary December estimates bring the production of N. A. C. C. members for 1933 to 1,491,305 units, an increase of 53 per cent over the year before. Because of the radical changes in new models, December production of companies belonging to the Chamber amounted to 39,576 cars and trucks, a decrease of 17 per cent under November and 53 per cent under the previous December.

Big Jump in Show Gate

NEW YORK—Alfred Reeves, manager of the national show being held here this week, announces that compared with the corresponding days last year, paid attendance was 112 per cent ahead on Saturday, 92 per cent up on Monday and 55 per cent better on Tuesday.

Nash Reports 1933 Loss

KENOSHA—A net loss of \$1,188,863 after all charges is reported by Nash Motors for the fiscal year ended Nov. 30, 1933. The charge for depreciation for the year was \$995,000. In the preceding year, net income of \$1,029,552 was earned.

Roosevelt Thanks Industry for Contribution to National Recovery; Cites 1933 Increases

NEW YORK—A congratulatory message to the automotive industry from President Roosevelt was the high spot of the annual banquet of the National Automobile Chamber of Commerce held at the Hotel Commodore on Tuesday evening of Show Week and attended by more than fourteen hundred motor executives.

The chief speaker of the evening was John B. Kennedy of the National Broadcasting Company, while the humor was provided by "Senator" Ford. Alvan Macauley, president of the Chamber and of the Packard Motor Car Company, was toastmaster.

In his message the President said: "I welcome this opportunity to express to you of the automotive industry my appreciation of the contribution you have made to national recovery. I realize that this contribution was made in spite of handicaps which might have proved literally crushing to men of less dauntless spirit than was demonstrated by the leaders of the automotive industry."

"The Department of Commerce advises me that the production figures

for your industry in the United States during the year just closed will show an increase of approximately 46 per cent over 1932 and it is possible that registrations of motor vehicles will show an even greater gain.

"Your exports, valued at \$82,000,000 in 1932, I am advised, exceeded that total in the first 11 months of 1933.

"Such improvement in this industry is particularly significant because it has an immediate and beneficial effect upon many other manufacturing industries. It has also made possible the giving of gainful work to many unemployed.

"I extend sincere congratulations for all that has been accomplished in the past and wish for you still greater progress during 1934 and future years."

At the president's table was assembled one of the greatest arrays of important figures in the industrial, banking and commercial fields. The honor guests were introduced by J. E. Fields, president of Chrysler Sales Corporation.

NEW

Ford Edgewater Strikers To Vote Return to Work

HACKENSACK—J. Glenn Anderson, counsel for the strikers of the Ford Motor Company's plant at Edgewater, said that a closed meeting of the strikers would be held this week, at which time the strike would be declared at an end.

"I submitted my report on our visit to Washington to the strikers at their meeting today," Mr. Anderson said, "and they expressed themselves as weary and exhausted and were ready to quit."

According to reports from the Ford plant office, strikers have been returning to work every week and that the number remaining out could not be more than 300.

NEWS

R. E. Olds Resumes Control Over Reo

Retains Chairmanship of Board—DeVlieg Becomes Works Manager

LANSING—Sweeping changes in the management of the Reo Motor Car Co. have been made public. Richard H. Scott, who for the past several years has been both president and general manager, retires as general manager.



R. E. Olds



Ray DeVlieg

Ransom E. Olds, pioneer automobile manufacturer and one of the founders of the company, who for the past several years has been chairman of the board, becomes also chairman of the newly formed executive committee, in whose hands the active direction of the corporation will rest.

Ray DeVlieg, for many years works manager of several plants of the Chrysler Corporation, and for the past three years assistant to Mr. Scott, also has been elected to the executive board and becomes the works manager of the company in full charge of Reo's factory operations.

New Flying Cloud Coming

NEW YORK—Reo will shortly introduce a new six-cylinder "Flying Cloud" model.

Automotive Industries

NRA Gives Car Makers 40-Hr. Week to Prevent Seasonal Influx of Workers

New Average Limit Contrasts with 35-Hr. Week Previously Permitted—Action Taken so That Automotive Centers Will Not Be Burdened with Unemployed During Slack Periods

WASHINGTON—To prevent an influx of workers into automotive manufacturing centers during seasonal production peaks, who could not be employed by the industry in slack periods, National Recovery Administrator Johnson this week approved an increase in weekly working hours to 40 averaged over the year as compared with the 35 permitted in the automobile manufacturing code as originally approved.

The announcement of the move created a stir inasmuch as it is the first code of a major industry to be so modified and to be changed in a direction opposite to that advocated by organized labor. In making the announcement, General Johnson said in part:

"The contemplated increase in automobile purchases in the spring of 1934, under the present average of thirty-five hours per week, will probably result in again attracting a considerable number of men to Detroit and other automobile manufacturing centers, who would be without jobs after the spring period of large production had passed."

"The last complete reports from manufacturers operating under the Code and who are members of the National Automobile Chamber of Commerce, showed that in September, 1933, employment was 150,756 as against only 73,411 in September, 1932, and 111,996 in September, 1930. The following table shows the number of

factory employees of the reporting members from 1929 to 1933 inclusive:

Year	September
1929	194,274
1930	111,996
1931	113,183
1932	73,411
1933	150,756

"This table indicates that there were 77,345 more workers employed in September of 1933 than in September of 1932, or an increase of approximately 105 per cent, and an increase of 38,760 workers over the same month in 1930, or an increase of approximately 34 per cent."

"While the employment level of 1929 has not been reached, it is my opinion that satisfactory absorption of labor should not be measured by employment in that year as there was a substantial percentage of floating workers brought to this industry from their normal pursuits, many, if not most of whom, it is my understanding, have since returned to their former homes."

"In addition, the decrease in production must be considered as indicated by the fact that the production in September, 1929, was 257,517 vehicles as compared with 144,367 in September of 1933, a decrease of 43 per cent, while employment in September of 1933 was only 22 per cent below that of September, 1929."

It was also pointed out by General Johnson that the modification is in accordance with a reservation by the industry when its Code was approved on September 3, 1933, to expire on December 31, 1933. The 35-hour week was prescribed in the Code with the understanding that if the Code was subsequently extended (as it was on December 18 to expire on September 5, 1934), the industry should be entitled to reconsideration of the maximum hours provision.

Ford Expected to Get U. S. Order for 700 Cars

WASHINGTON—Indications are that the Northwest Motor Co., Bethesda, Md., will be awarded the contract for 700 automobiles on which bids were opened last Saturday by the Department of the Interior.

That the Ford company will get the award of the 700 cars from the Interior Department has been indicated by the fact that Mr. McCarl last Tuesday refused to approve payment for 12 cars bought by the Interior Department not of the Ford make when the Ford bids were the lowest submitted. The Interior Department had declined to purchase Ford cars because Mr. Ford had not signed the automobile code. Some of the 12 cars were bought at Caspar, Wyo., and others at Salt Lake City, Utah, and have been delivered. Apparently they will have to be returned to the bidders.

Will Offer Diesel Optional in 1934

COLUMBUS—Following the recent period of activity in the transportation field, the Cummins Engine Company announces that 10 truck

manufacturers and six builders of industrial equipment are prepared to supply the Cummins diesel engine in 1934.

The list of these manufacturers follows, the last six being industrial equipment makers:

Four Wheel Drive Auto Co., Gramm Motors, Inc., Kenworth Motor Truck Corp., Kleiber Motor Co., Linn Mfg. Co., Robert Gotfredson Truck Co., Sterling Motor Truck Co., Ward-LaFrance Truck Corp., Indiana Div., White Company, Moreland Motor Truck Corp., The Fate-Root-Heath Co., Mid-West Locomotive Works, H. K. Porter Co., Vulcan Iron Works, Whitcomb Locomotive Co., Austin Machinery Co.

Employment Up 86 P.C. At Libbey-Owens-Ford

TOLEDO—With the recent addition of 1060 employees at the plants of the Libbey-Owens-Ford Glass Co., a new all-time employment record has been established for the company. The total working force is now in excess of 5000, an increase of 86 per cent over the employment total of a year ago.

January 13, 1934

Chrysler Tops 1929 with Output of 448,697

DETROIT — Preliminary figures covering production and shipments of Chrysler Motors for the year just ended show that in 1933 the corporation's output exceeded its previous peak of 1929. Last year the corporation produced and shipped 448,697 units, as compared with the previous peak of 448,255 units in 1929. Production and shipments in 1933 were more than twice the corporation's 1932 output of 222,602 units. Commercial car production during 1933 totaled 38,831 units. This was three and one-half times the commercial car output in 1932.

In the passenger-car lines, Ply-

mouth production and shipments, amounting to 261,328 cars, were more than twice the 1932 shipments of 124,782 cars. Dodge, in 1933, produced and shipped more than three times its 1932 output, shipments in 1933 totaling 96,148 units, as against 31,259 units in 1932.

Comparative figures for the first eleven months of 1933—the latest available—show that Chrysler Motors accounted for one-third of the total production of member companies of the N.A.C.C., the largest in the corporation's history, as against one-fourth of the total output in the previous year.

Studebaker Exports Best Since 1929 Top

Trucks Show Gains In Domestic Field

SOUTH BEND—Exports of Studebaker passenger cars during 1933 were the largest since 1929, and shipments of Studebaker, White and Indiana trucks and buses registered substantial gains over 1932, according to Arvid L. Frank, vice-president and general manager of the Studebaker-Pierce Arrow Export Corp.

"The largest increase in 1933 car exports was made during the last three months of the year," he said. "Shipments for this quarter exceeded those during the same period of 1932, 1931 and 1930 by 312 per cent, 810 per cent and 310 per cent respectively. Exports of Studebaker trucks during the fourth quarter increased 240 per cent over the same period in 1932 and 338 per cent over 1931.

"For the year, Studebaker trucks showed an 88 per cent improvement over 1932," Mr. Frank stated. "Shipments of White trucks and buses were 52 per cent ahead of 1932, and exports of Indiana trucks and buses increased 876 per cent.

"The most significant feature of the year's export business was that December shipments abroad represented the largest month of the year and followed two months each of which established a new record since June, 1929."

Vidal Heads Air Transport Coordination Committee

WASHINGTON—Organization of an Interdepartmental Committee on Air Transport System to coordinate Federal policies with respect to air transportation in the United States, was announced today at the Department of Commerce. The committee was formed under the sponsorship of the Secretary of War, the Postmaster General and the Secretary of Commerce.

Eugene L. Vidal, Director of Aero-

navics of the Department of Commerce, is chairman of the committee. The Post Office Department representative is William W. Howes, Second Assistant Postmaster General, and the War Department member is Maj. Gen. Benjamin D. Foulois, Chief of the Army Air Corps.

Makers Endorse Low Price Plane Proposal

NEW YORK—Twenty-two of the leading manufacturers of airplanes in the United States met at the Aeronautical Chamber of Commerce of America, Inc., on Jan. 9 and adopted a resolution supporting the proposal of Eugene L. Vidal, Director of Aeronautics in the Department of Commerce, to develop a new, low-priced, quantity-production airplane with the assistance of public works funds provided by the Government to foster private flying.

Within the next few days the manufacturers will appoint a committee of five of their number to cooperate with the Government in developing technical specifications, and another committee of five later will be named to work out a plan for the industry's participation in the development and production of the plane and its engine.

New Gasoline Blend Bill Introduced in Congress

WASHINGTON—A new bill calling for compulsory blending of 10 per cent by volume of domestic agricultural alcohol with all motor fuel sold in the United States was introduced in the House of Representatives Jan. 3 by Frank Gillespie of Bloomington, Ill., Representative from the 17th Illinois district.

The bill is similar in most respects to those introduced at the last session by Congressman Dirksen of Illinois and others. It provides that 2 per cent of alcohol manufactured from "corn or other domestic commodities" shall be blended with all motor fuel

sold within 90 days after the proposed law becomes effective. Two per cent alcohol is to be added each month thereafter until the 10 per cent by volume is reached.

Congress refused to pass mandatory alcohol blend legislation, which would have increased motor fuel costs by an estimated \$350,000,000, at the last session, but provided that hearings be held on the proposal. These have been repeatedly postponed, with the first now scheduled to be held during January.

Commerce Dept. Names "Fliver" Plane Group

E. P. Warner, Amelia Earhart and Al Williams Among Those Selected

WASHINGTON—Secretary of Commerce Roper today authorized the appointment of a committee to serve in connection with the development of an inexpensive, volume-produced airplane for private flying. The PWA recently announced the allotment of \$500,000 to the Aeronautics Branch of the Department of Commerce for this development work.

The membership of the committee is as follows:

Eugene L. Vidal, Director of Aeronautics of the Department of Commerce, chairman; Col. J. Carroll Cone, representing the National Aeronautic Association; Amelia Earhart; Dr. George W. Lewis, National Advisory Committee for Aeronautics; Robert B. Renfro, editor *The Sportsman Pilot*; Leighton Rogers, Aeronautical Chamber of Commerce; Fred L. Smith, National Association of State Aviation Officials; Edward P. Warner, Society of Automotive Engineers; and Al Williams, American Petroleum Institute.

Ford Reopens Plants At Norfolk and Dallas

DETROIT—Reopening on Feb. 1 of assembly plants at Norfolk, Va., and Dallas has been announced today by the Ford Motor Company. Tentative schedules call for assembly of roughly 200 cars daily at each plant. This brings assembly plants in operation to a total of ten. Ford January production schedules now total 55,000 units as against original schedule of 46,000.

Edison Absorbs Emark

WEST ORANGE—Emark Battery Corp., and Thomas Edison, Inc., have been merged as of Dec. 30, 1933, into a single corporation under the name Thomas A. Edison, Inc. Business activities of Emark will be carried on as heretofore by Emark Battery Division of Thomas A. Edison, Inc., under the management of Edwin D. Martin, vice-president and Emark manager.

Financing Plans Hold Up Willys Production

Receivers and Trustee
Asked to Compromise—
Orders Total 5800 Cars

TOLEDO—A deadlock over the terms of the receivers' certificates to be issued in connection with financing of 5,000 Willys 77's authorized by Federal Court here, may seriously delay the production schedule for Willys-Overland, it was revealed in court here Monday.

Attorney George D. Welles, representing the National City Bank, trustee for bondholders, has told the court that bondholders will make no objection to the issuance of receivers' certificates provided the bondholders' first mortgage lien is not disturbed, and provided receivers will stand possible losses that might be sustained through operations.

He also urged a limit of \$100 per car, rather than the blanket \$750,000 issue of certificates sought by receivers.

The court held it did not wish to make an arbitrary order subject to further litigation in higher courts. He advised attorneys to get together and agree on a form for the certificates.

It was said there are orders for 5,800 of the cars now on hand.

L. A. Miller, president of Willys-Overland, recently relieved of duties as receiver, has announced his business address care of Field, Glore & Co., brokers, Chicago, and said reports that he is associated with the International Harvester Co. were not authorized.

Field, Glore & Co., closely associated with Marshall Field properties, have interests in both companies and in many other industries, and it is believed Mr. Miller may have some

special assignments in connection with the Field properties and holdings.

"Through the splendid cooperation of the Federal Court, the International Harvester Co., and our distributors, it was possible to operate all plants in 1933, and plans are now being made to finance further production of passenger cars," said President Miller.

"It seems entirely possible to reorganize the company, and I hope in time to take advantage of the anticipated improvement in business this year."

Edwin Davies, head of the Willys-Overland Pacific Co., has been here in connection with the negotiations for financing the cars.

Dealers Hear Col. Lea

NEW YORK—Code activities held the center of the stage at the eleventh annual Eastern District Convention of the National Automobile Dealers Association, held on Monday of Show week. C. B. Warren of Warren-Nash presided. Speakers included F. W. A. Vesper, N.A.D.A. president and chairman of the National Control Committee; T. Southworth, chairman of Metropolitan New York Advisory Committee; Jack Frost, N.A.D.A., and Col. R. W. Lea, deputy administrator, NRA.

Buick Appoints Corpe as Advertising Manager

FLINT—T. H. Corpe, advertising manager, General Motors of Canada, Ltd., has been transferred to Flint, where he becomes advertising manager of Buick. He is succeeded in the Canadian post by Claude V. Watt, formerly with the Winnipeg branch of the General Motors. Mr. Corpe succeeds C. C. Lewald, who resigned.

Lagging Auto Output Delays Steel Buying

Spring Expected to Double Present Steel Production

NEW YORK, Jan. 11—While the steel industry is still waiting for representative tonnage business to be placed by automotive consumers, encouraging numbers of odd-lot orders were received this week, indicating quite clearly that reserve stocks of some buyers are running low.

Considerable optimism prevails in the steel market, so much so that predictions were made this week that before Spring is upon us, the present operating rate of mills would be doubled. The Atlantic States Shippers' Advisory Board has forecast a 50 per cent increase in iron and steel carloadings during the current quarter.

Tapering down of activities this week in some of the Shenango and Mahoning Valley rolling mills is looked upon as strictly temporary, to be followed, very likely next week, by a marked stepping up of operations. Inasmuch as buyers have nothing to gain from delaying their commitments, sheet and strip mills look for an influx of business as soon as the programs of motor car manufacturers have been formulated. Ford Motor Company schedules give much encouragement in this direction.

Wages for sheet mill operatives in all plants affiliated with the Amalgamated Association of Iron, Steel and Tin Workers will remain unchanged this and next month, wage scales being based on average sales prices of sheets in the preceding two months. Second-quarter prices in the steel market will be determined on the basis of the extent of first-quarter demand and the general monetary situation at the time when notice of impending price changes has to be filed under the code's provisions.

The placing first-quarter business, with prices firmly fixed, will be very much of a routine affair, except insofar as some consumers may find it advantageous to cover part of their second-quarter requirements in advance, taking in the steel during the first quarter and stocking it.

PIG IRON—Heavier releases are expected as automotive foundries begin to increase their melts. Code prices are strictly adhered to in what few new transactions are taking place.

ALUMINUM—There has been a slight shift in secondary aluminum quotations in the Middle West markets, No. 12 being marked fractionally higher and straight remelted metal a shade lower. On the whole, however, the market is steady. Quotations for virgin metal are unchanged.

COPPER—Unchanged and dull at 8½c, delivered Connecticut Valley, but the possibility of a sharp rise as the result of a sudden agreement on the still pending code differences is freely discussed in the market.

TIN—Declines on the London Metal Exchange as well as in the Sterling market caused the week's opening price for Straits to recede about ¼c from last week's close, spot metal being quoted on Monday at 51.85c.

Passenger Car Production by Wholesale Price Classes

(U. S. and Canada)
Eleven Months 1933 and 1932 Compared

	1933	1932	Per Cent Change	Per Cent of Total 1933	Per Cent of Total 1932
Under \$500	1,309,329	727,312	+80.0	81.6	66.1
\$501-\$750	227,627	246,372	- 7.6	14.2	22.4
\$751-\$1000	29,862	71,469	-58.3	1.9	6.5
\$1001-\$1500	17,806	34,745	-48.7	1.1	3.4
\$1501-\$2000	9,956	8,023	+24.0	0.6	0.7
\$2001-\$3000	8,100	8,169	- 0.8	0.5	0.7
\$3001 and over	1,807	2,409	-25.0	0.1	0.2
Totals	1,604,487	1,098,499	+46.3	100.0	100.0

Truck Production by Capacities

(U. S. and Canada)

	1933	1932	Per Cent Change	Per Cent of Total 1933	Per Cent of Total 1932
1½ tons and under	307,738	206,162	+49.0	92.3	92.3
2 to 3 tons	21,220	12,340	+71.6	6.4	5.5
3½ tons and over	3,174	4,012	-21.0	0.9	1.8
Ambulances, fire, buses, etc.	1,199	989	+21.2	0.4	0.4
Totals	333,331	223,503	+49.1	100.0	100.0

Ford Declares Belief in Ideals behind NRA

NEW YORK—Henry Ford declared his complete belief in the ideal behind the NRA in an interview published in the *New York Times* on Thursday of this week. More than that, the *Times* correspondent says, he called the NRA the first move, though a faulty and halting one, toward a new industrial and social era which, when it comes, will be a millennium of justice and plenty.

"The greatest criticism Mr. Ford made of the NRA," the *Times* story continued, "was not that it interfered in industry, but that it did not go far enough—that and his belief that there is too much selfishness in the support being given the NRA and that it is pretty much in the hands of the same old crowd who were the high priests of the 'old deal.'"

"It is Mr. Ford's belief that the whole industrial system, especially the distribution phase of it, is shot through with faults. It is basically wrong, he feels, because it is devoted

to making money instead of making human values. It must be reformed clear down to the bottom. . . . He believes furthermore . . . that President Roosevelt may be leading the way to the complete reform he envisages."

On the subject of competition, Mr. Ford said, "But if these supporters of the NRA keep on trying to crush competition they'll get left. Competition furnishes the incentive for people to rise, for genius to come up."

The *Times* correspondent also stated that Mr. Ford had made known his attitude on NRA directly to Washington.

Three New Franklin Series Exhibited at N. Y. Show

NEW YORK—Three groups of cars comprise the Franklin line for 1934, viz., the Olympic with a base price of \$1,435; the Airman with a base price of \$2,185, and the Twelve, at \$2,885. A number of refinements have been made in the two first-men-

tioned cars. The Olympic appears for the first time with a sloping V front. Changes in the powerplant of the Olympic and Airman involve redesigned pistons, connecting rods and wrist pins, a larger oil pump and additional oil leads, temperature control of the oil by a new cooler, and a new, double-bore type of cylinder. The Olympic, in addition, differs from the car of a year ago in having a frame with X-member and box-section side rails, silent U-spring shackles and kick shackle, an integral free-wheeling unit, needle-bearing universal joints, and a six-point mounting for the powerplant. Changes have been made also in the instruments and dash controls.

The Olympic line includes a five-passenger sedan, a coupe, and a convertible coupe, while the Airman line includes a five-passenger sedan, a seven-passenger sedan, and a five-passenger club sedan, all on a chassis of 132-in. wheelbase. Aside from the restyling of the hood, changes have been made in the fenders, running boards, splashers and the body rear panels.

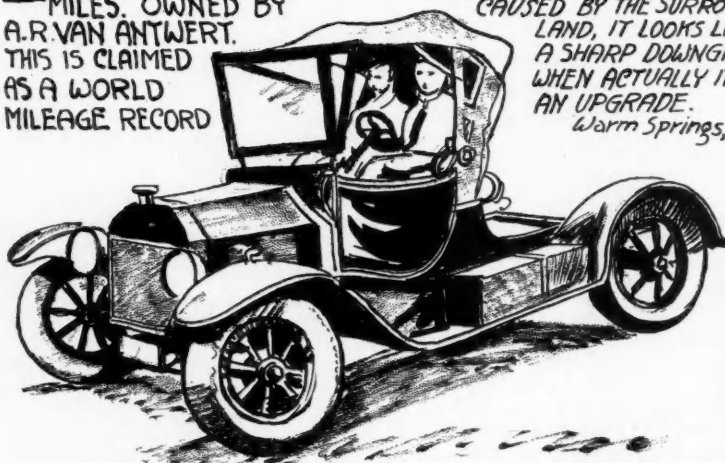
Automotive Oddities—By Pete Keenan

Write us if you know an Oddity

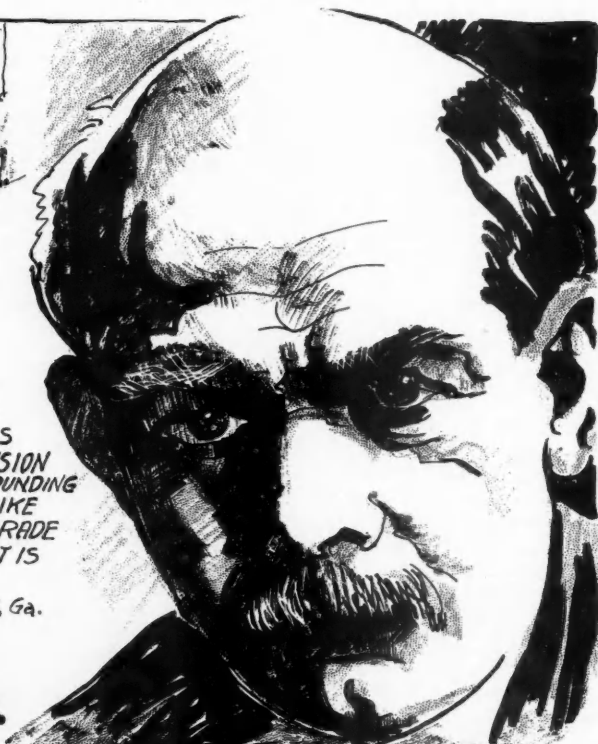
MISS NEISS
NEW CARR
LIVES IN MIAMI,
FLORIDA.



MODEL "T" WITH 538,000
MILES. OWNED BY
A.R. VAN ANTWERP.
THIS IS CLAIMED
AS A WORLD
MILEAGE RECORD



MAGIC HILL. IF A
CAR STANDS FREE IT WILL
COAST BACKWARDS. THIS IS
DUE TO AN OPTICAL ILLUSION
CAUSED BY THE SURROUNDING
LAND, IT LOOKS LIKE
A SHARP DOWNGRADE
WHEN ACTUALLY IT IS
AN UPGRADE.
Warm Springs, Ga.



GUTZON BORGLUM, WHO
SCULPTURES MOUNTAINS, HOLDS A
MECHANICS CARD. HE INVENTS AND
DESIGNS AUTOMOBILE AND AIRPLANE
ENGINES.

Empire State Flays Fleet Discount Ban

WASHINGTON—Elimination of discounts under the motor vehicle codes will increase costs in New York State by \$125,000 annually, according to Mary E. O'Connor, director of the Division of Purchase for New York State. She made this declaration in the course of complaints against price increases under codes presented at the public hearing in Washington on the effect of NRA codes on prices.

"Loss of 25 per cent discount on repair parts for automotive equipment will account for another \$25,000," she continued.

She also attacked the provisions of many codes which prevent a quantity purchaser such as a State government from getting lower prices due to large supplies bought, and turned her attention to costs of gasoline.

"I know," she said, "of no reasonable argument to prove that the man who uses 250 gal. of gasoline a year for a pleasure car should be placed in the same classification as the State of New York with its purchase of 7,000,000 gal. per annum. I know of no reason why the fleet owner of 3000 pieces of gasoline consuming equipment should pay the same price for such equipment and repair parts as the owner of an individual car."

Vidal to Address Phila. Section on Cheap Planes

PHILADELPHIA—Eugene L. Vidal, director, Aeronautics Branch, Dept. of Commerce, will speak before the Philadelphia Section, S.A.E., on Jan. 17 concerning the proposed program of building 10,000 planes to sell at about \$700. As mentioned in *Automotive Industries* last week, Mr. Vidal's department has been appropriated a sum of \$500,000 with which it is expected to finance the development of fuselage and power plant designs coming within the specified price range. W. Laurence LePage, well-known aeronautical engineer will preside at the joint meeting of the S.A.E. and the Aircrafters.

Harriman Succeeds Muir

WASHINGTON—W. Averell Harriman, New York, has been named by National Recovery Administrator Hugh S. Johnson, as Division Administrator of the NRA in charge of Division II to succeed Malcolm Muir, whose resignation was accepted early this week.

Mr. Harriman is chairman of the executive committee of the Illinois Central Railroad and chairman of the Aviation Corporation as well as director in a number of other corporations including the Guaranty Trust Co. of New York, the Manhattan Co., the Union Pacific Railroad and the Western Union Telegraph Co.

In accordance with the established policy that Division of Deputy Administrators will not handle codes for industries in which they have any interest, the transportation industries codes heretofore assigned to Division II have been transferred from that Division to Division V under Division Administrator Sol Rosenblatt.

Motor Boat Show Opens January 19

NEW YORK—The 29th annual National Motor Boat Show, the big mid-winter event of the pleasure boat world, will open here on Jan. 19 at Grand Central Palace.

Crockett With Cletrac

CLEVELAND—C. B. Crockett, former secretary of the Industrial Truck Association and more recently a partner in the firm of Crockett, Lightner & Smith, has joined the Cleveland Tractor Company as sales engineer, to develop the application of Cletrac Crawler Tractors with necessary special equipment to the problem of material moving in industrial plants and for more general purposes in railway use.

Herrick Rejoins Lycoming

NEW YORK—Edward D. Herrick has rejoined the Lycoming Mfg. Co. in an engineering capacity. Mr. Herrick left Lycoming late last summer to become vice-president of the Johnson Bronze Co., Newcastle, Pa., from which position he recently resigned.

New Automatic Starter

DETROIT—A new automatic starter control developed by E. S. Evans & Sons, Inc., of this city, is being placed on the market through accessory dealers. The device, it is said, can be installed on any car.

Rim Output Up 39%

CLEVELAND—Rim inspections and approvals in 1933 increased 39 per cent over the previous year, according to Tire and Rim Association. The total number approved was 8,713,962, as compared with 6,261,336 in 1932.

Bendix 1933 Earnings \$3,000,000 Above 1932

CHICAGO—In a preliminary statement to the stockholders of Bendix Aviation Corp., Vincent Bendix, president of the company, says: "The results from operations of your company for the year 1933 will show an improvement over 1932 of more than \$3,000,000 net, after allowing for full depreciation, taxes, and other deductions."

Olds to Have Bigger Dealer Organization

Shipments of Low Price Six Start in February

NEW YORK—Oldsmobile cars in the new low-price class will be available for dealer stocking in February, and for quantity acceptance by consumers early in March, according to E. L. McCuen, president and general manager of the Olds Motor Works division of General Motors. Mr. McCuen made this statement at the largest meeting of Olds dealers ever held, which took place at the Hotel Roosevelt, New York, on Tuesday of National Show week. More than 1100 were present at the meeting. R. H. Grant, vice-president and director of sales of General Motors, and W. L. Knudsen, executive vice-president, General Motors, were other speakers. D. E. Ralston, Oldsmobile vice-president and salesmanager, conducted the meeting.

The Oldsmobile dealer organization will be expanded after a careful study of territorial conditions, Mr. Ralston indicated. In 1933, 1700 out of 4400 counties in the United States did not have a new Oldsmobile registered, he said. With the company operating in the low-priced field, it will also be necessary to add more dealers' salesmen and zone managers will set quotas for the number of salesmen who should be employed by each dealer.

Emphasis will be placed on demonstrations of the new car, and quotas for demonstrations per salesman will also be set up with due regard for the experience of the salesmen involved.

Mr. Grant made a strong plea for dealers to adhere to the delivered-price schedules suggested by the Corporation. If they were followed to the letter, he said, there was a good possibility for Olds dealers to make the same net profit on the new low-priced six, per car, as they formerly made on the six-cylinder car in a higher price class.

The sales policy of the Corporation, Mr. Grant indicated, is grounded on maintaining the net profit of dealers at a figure comparable or better than profits made with a larger gross allowance, before code restrictions on trading were effected. Should subsequent events prove it necessary the present price schedules and allowances might be changed, but a fair trial should first be given them.

The Oldsmobile meeting was attended by about 30 General Motors top executives, including Lamot Du Pont, chairman of the board.

August Duesenberg Appointed

INDIANAPOLIS—August Duesenberg, brother of the late Fred Duesenberg, has been named chief engineer of Duesenberg, Inc.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

Except for a momentary unsettlement in the bond market, business and financial conditions have not been greatly affected by the President's budget message forecasting an increase of some six billions of dollars in the public debt over the next six months. Both wholesale and retail trade were well maintained last week, with prices generally firm. Such declines as were reported in trade and industry appeared to be mainly seasonal in character.

Car Loadings Top 1932

The volume of railway freight traffic declined seasonally during the week ended Dec. 30, with total loadings of 450,622, cars, showing a decrease of 76,445 cars below the figure for the preceding week but a gain of 45,321 cars over that for the corresponding period last year. Loadings for the year aggregated 28,960,910 cars, which represents an increase of 780,958 cars, or 2.8 per cent, over the total for 1932.

Power Output Increased

Production of electricity by the electric light and power industry of the United States for the week ended Dec. 30, was 8.8 per cent larger than in the corresponding period of 1932.

Oil Production Below Quota

Crude oil production declined sharply below the Federal quota during the week ended Dec. 30, with an average daily output of 2,139,850 barrels, as against 2,289,900 barrels in the preceding week and 1,698,150 barrels in

the corresponding period a year earlier. The Federal quota is 2,210,000 barrels daily.

Coal Production Off

Bituminous coal production during the week ended Dec. 23, averaged 1,197,000 tons daily, as against 1,227,000 tons a week earlier and 1,278,000 tons a year ago. Production for the calendar year to date totals 231,497,000 tons, as compared with 297,879,000 tons in the similar period of 1932 and 524,775,000 tons in the like period of 1929.

Bank Debits Drop

Bank debits to individual accounts outside of New York City for the week ended Jan. 3, were 9 per cent below the total for the corresponding period last year.

Commodity Prices Firm

Professor Fisher's index of wholesale commodity prices for the week ended Jan. 6, stands at 72.0, as against 71.8 a week before, 71.4 two weeks before, 72.0 three weeks before, and 71.7 four weeks before.

Federal Reserve Statement

Bill and security holdings of the Federal Reserve banks increased \$6,000,000 during the week ended Jan. 3, with a rise of \$10,000,000 in holdings of bills bought in the open market, a decline of \$5,000,000 in discounts, and practically no change in holdings of government securities. Federal Reserve note circulation declined \$9,000,000, while deposits increased \$49,000,000 and reserves \$18,000,000.

Ford Now Making Own Safety Glass

DETROIT—Ford Motor Co. is reported to be in production on safety glass. Using purchased sheets, it is understood that polishing, cutting and cementing operations are being performed at the Rouge plant. The sheets are bought outside it is said because the Ford glass-making equipment is not adapted to the thin sheets required for safety glass.

It is understood that the company is producing safety glass with the sheets polished only on one side, the unpolished surfaces, of course, being used on the inside.

Malcolm Muir Leaves NRA

WASHINGTON — Malcolm Muir, Division Administrator of the National Recovery Administration and one of the chief aides to General Johnson since the inception of the NRA, has resigned to devote his full

time to his duties as President of the McGraw-Hill Publishing Co. in New York. Among the important codes handled by Mr. Muir were the approved bus code and the pending trucking code.

GM Sales in 1933 Show 54% Increase

Dealer Stocks Decline 26,577—December Sales Reveal Sharp Decrease

NEW YORK—Retail sales of General Motors cars and trucks to consumers in the United States totaled 755,778 in 1933, an increase of 48 per cent over the 510,060 sold in 1932 and a decrease of 19 per cent from 1931.

Sales to United States dealers amounted to 729,201. Comparing this total with that of sales to consumers indicates a decrease in dealer stocks of 26,577 during the year. Sales to United States dealers in 1932 were 472,859, making the 1933 increase 54 per cent.

World sales to dealers numbered 869,035 in 1933 against 562,970 in 1932, a gain of 54 per cent. The indicated total of export business is 139,834, representing an increase of 55 per cent over the 1932 total of 90,111.

December sales to United States consumers shrank to the low total of 11,951 as compared with 35,417 in the preceding month and 19,992 in the corresponding month of the previous year. Sales to United States dealers dropped to 11,191 as compared with 44,101 in December, 1932, but showing a relatively large gain over the 3,483 shipped in November, 1932. World sales to dealers in December were 21,295 against 10,384 in the preceding month, and 53,942 in the corresponding month of 1932.

New Dodge Truck Line

NEW YORK—New 1934 Dodge truck models were shown for the first time at the New York Show. The program for the year includes an additional 1½-ton line, while other models are being offered in additional wheelbases.

APEM Organizes Credit Service for Members

DETROIT—APEM announces formation of Automotive Credit Service, Inc., to furnish credit information covering sales on original equipment as well as on approximately 6,000 automotive jobbers and, as far as practical, other concerns in whom credit men of the industry are interested. The organization is expected to go into operation in about ten days, at which time rates to be charged and makeup of the organization will be announced. Temporary headquarters of Automotive Credit Service, Inc., is in General Motors Building offices of APEM.

NRA Studies Uniform Cost Accounting System

Trade Associations Asked To Aid Industry Planning

WASHINGTON—Control of manufacturing costs through a uniform system of cost accounting to be developed by trade associations is a measure said to have been adopted in part by the NRA. At the request of the NRA, W. Clement Moore of the Philadelphia Board of Trade and John K. Hulse have prepared a comprehensive plan which has been adopted with some reservations and revisions.

Instead of using average costs, the authors of the plan propose a system of frequency costs and rates based on normal operations. Under the plan each industry through its trade association would develop its own cost system embracing a control of basic costs by uniform cost accounting, even to the point of a uniform schedule of account items. It involves a uniform system of depreciation accounting, depreciation to appear in the record segregated in approved fashion.

When a uniform system has been worked out by the trade association, it is to be submitted to the department of planning and research of the NRA for study and approval. Presumably the next step would be to write the plan into the new or existing Code for the industry.

Indications are that the operation of the cost system would extend to the salaries of high executives with some measure of control since such salaries are a part of the basic costs of the manufacturer. To the basic costs arising from this plan, are to be added the fair costs of distribution and profit which are presumed to vary as between different organizations, the total representing the fair selling price for each producer.

As the first broadside in this campaign, the NRA already has mailed Form 1549 to all code authorities for the purpose of accumulating certain essential data. The Form is a questionnaire seeking comprehensive data such as: number of employees, man-hours, payroll, machine operation and inventory, production, stocks, etc., also quarterly financial statements as well as cost reports.

December Registrations Placed at 63,500 Cars

PHILADELPHIA—New car registrations for December amounted to 63,500, as compared with 45,683 a year ago and 94,180 during November of this year, according to estimates based on returns from nine States. This represents an increase over last year of about 40 per cent, but shows a decline from November, 1933, of approximately 33 per cent.

Based on these partial returns, Plymouth leads the field with 17,800, Ford is second with 15,700 and Chev-

rolet is third with 9,800 units, all showing increases over December of last year of 73, 27 and 12 per cent, respectively.

Actual returns for 11 months plus this estimate for December indicate that the yearly total will be approximately 1,499,000 units, as compared with 1,096,399 units registered during 1932, a gain of 37 per cent.

Bursting Pipes Ruin N. Y. Show Decorations

NEW YORK—Bursting pipes in the Grand Central Palace building about a week prior to the opening of the New York Automobile Show, caused widespread damage to the modernistic decorations which provide the most attractive background the Show has had in many years. Fortunately by scouring the city for replacement materials, Sam Asch, decorator, was able to replace the damaged sections in time for the Show opening.

The pipe failures were occasioned by the fact that the steam company which supplies the Palace with heat, discontinued service and, as a consequence, during the cold weather of 10 days ago, the pipes froze.

Streamlined Packard

NEW YORK—Packard has on display at the Show a special coupe model with radically streamlined rear end, but having the more or less conventional Packard hood and frontal appearance. It is understood that the job was built primarily for exhibition purposes.

Campbell Joins Graham

DETROIT—Colin C. Campbell, formerly with Grace & Holliday Adver-



Colin C. Campbell

tising Co. has been appointed director of advertising of Graham Paige, succeeding Karl Bronson who becomes advertising manager of Nash.

Bus Code to be Revised

WASHINGTON—Hearing will be held Jan. 16 on a petition of the Motor Bus Association for an amendment to the code of the motor bus industry. The proposed amendment would authorize the code authority to fix reasonable motor bus rates and regulations upon complaint by any passenger motor carrier. The hearing will be held before Deputy Administrator E. M. Hughes.

Export Meetings Reflect Better Foreign Outlook

Mooney, Moock and Merrill Speak at International Day

NEW YORK—As a result of rising sales in many parts of the world, great interest attached to export activities during the show this year, and the annual International Day, an annual Monday feature, drew larger and more enthusiastic attendance than any year since the depression began. So large was the attendance that the luncheon and meeting, formerly held in the members' room of the N.A.C.C., had to be taken this year to the Ambassador Hotel, and the room there was crowded, with several additional tables being necessary at the last moment to care for the unexpected attendance of exporters and those who wanted to know about the returning sales of American automobiles in all parts of the world.

Numerous dealers and distributors were guests of the chamber at the luncheon and they, with factory executives, heard an unusually interesting program of speakers. Under the chairmanship of Robert C. Graham, who heads the export committee of the chamber, various phases of our international position were discussed. Speakers included John L. Merrill, president of the All-America Cables and president of the Pan-American Society. Mr. Merrill spoke feelingly of the countries to the south of us, saying that the recent Montevideo conference had engendered a fine feeling of friendliness for this country and predicted that, as a result of Secretary Hull's efforts at that meeting, trade relations with Latin-America would be materially improved over the coming months.

Also speaking at the luncheon were James D. Mooney, of General Motors and president of the American Manufacturers' Export Assn. He was followed by Harry G. Moock, general sales manager of Plymouth Motors, who discussed automobile merchandising in its various phases. Samuel D. Post, vice-president of the Guaranty Trust of New York, spoke on foreign exchange, saying that exchange restrictions were tending to ease themselves and that, while not stabilized, fluctuations had recently been considerably lessened. Arnold Van Rongen, president of the Automobile Chamber of Commerce of Holland, also spoke, returning the greetings of the overseas guests to the address of welcome by Alfred Reeves of the chamber.

Also of export interest during show week were the export managers' annual meeting, on Tuesday, at the chamber headquarters, and the annual show luncheon, on Thursday, of the Overseas Automotive Club. Chief speaker before the club was Pyke Johnson, vice-president of the chamber, who discussed the export outlook from the Washington standpoint.

Marmon Purchasers To Continue Sixteen

INDIANAPOLIS—Purchase of the product name and certain other assets of the bankrupt Marmon Motor Car Company has been effected by the American Automotive Corporation here, it is reported here.

A. D. Sterner and S. N. Wheeler, heading a national investment bankers' syndicate, are the leaders in the transaction. Harry A. Miller, engine and race car designer, it is said, will be an officer of the new company.

The company plans to start with a capital of \$500,000 unobligated. Parts of the Marmon properties are to be used by the company which plans to continue manufacture of the Marmon 16-cylinder car.

Marine engines, racing cars, aircraft engines as well as specialized equipment for the United States army figure in the plans.

No connection exists between the new company and the Marmon-Herrington Truck Company, although the truck company will surrender part of its plant to the new concern. The truck company holds its plants on lease from the defunct Marmon Motor Car Company.

Truckers Sue to Bar "Store-Door" Delivery

Injunction Is Asked Against Four Railroads

CLEVELAND—A petition asking that four railroads be enjoined from carrying on a "store-door" delivery service was filed in Federal Court here by the Ohio Association of Commercial Haulers.

Defendants are the Pennsylvania, New York, Chicago & St. Louis, the Grand Trunk & Canadian National and the Erie Railroads. In addition to the injunction, a judgment for any loss the truckers may have sustained due to the "store-door" service of the railroads is asked.

It is alleged that the rates charged for the service by the railroads are, in some cases, less than the amount the railroads pay for trucking alone. The Interstate Commerce Commission, the petition alleges, approved the rates "without due public hearing." The petition says that the NRA opposes monopolies and the truckers allege that the new service tends to give the railroads a monopoly of the trucking business locally.

Marmon-Herrington Orders Exceed Last Year's Total

INDIANAPOLIS—A. W. Herrington, president, Marmon-Herrington Truck Company, reported that orders on the books of the company as of Jan. 1 exceeded the total business for 1933.

Herrington said that contracts for all-wheel drive trucks are held with

the State highway departments for almost half of the States and that contracts also have been obtained for construction of trucks for Federal departments. He added that overseas orders were included and that indications of improvement in the export trade were growing stronger.

Reo Shows Big Increase

NEW YORK—At the first Reo dealer meeting under the new management, Elijah G. Poxson, general sales manager, reported that Reo sales increased 42.6 per cent for 1933, as compared with volume in 1932.

Federal Automobile Tax \$23,000,000 in Nov.

WASHINGTON—Total Federal excise taxes on the automotive industry for the month of November were \$23,000,000, against \$31,000,000 for October and the Treasury estimate of \$16,000,000 (excluding $\frac{1}{2}$ ¢ additional gas tax imposed by Recovery Act and expiring Jan. 1, 1934).

There was a reduction in all classifications. Gasoline tax collections dropped \$5,500,000 from October, while collections on tires and tubes showed the next largest drop of \$1,432,000.

The figures are as follows:

	November	October	Treasury Estimate
Lubricating oil	\$1,692,214.83	\$2,091,132.24	\$1,833,333
Gasoline	17,037,101.66	22,540,726.51	11,500,000
Tires and tubes	1,825,439.78	3,257,191.69	1,583,333
Trucks	306,351.08	377,868.59	166,666
Automobiles	2,071,786.99	2,568,049.79	1,250,000
Parts and accessories	409,938.79	491,556.38	417,500
	\$23,342,833.13	\$31,326,525.20	\$16,750,832

Delco Changes Name

ANDERSON—Effective Jan. 1, the corporate name of the Delco-Remy Corp., has been changed to the Delco-Remy Division of General Motors.

Clark Made Genl. Mgr.

PROVIDENCE—E. E. Clark has been appointed general manager in charge of operating divisions of The American Screw Company. Mr. Clark is well known in the hardware industry as a sales and production executive.

Dividend by Briggs

DETROIT—Briggs Manufacturing Co. has declared a cash dividend of 25 cents a share on no par value stock, payable Jan. 30 to stock of record Jan. 15.

Eaton Parts Shipments Larger in January

CLEVELAND—January automobile parts shipments of Eaton Mfg. Co. will exceed those of December, 1933, by from 40 to 45 per cent, and will be about 50 per cent greater than shipments made in January, 1933, according to J. O. Eaton, chairman of the board.

CALENDAR OF COMING EVENTS

AUTOMOBILE SHOWS

Toronto, Ont.	Jan. 13-20
Milwaukee, Wis.	Jan. 13-20
Newark, N. J.	Jan. 13-20
Cleveland, Ohio	Jan. 13-20
Buffalo, N. Y.	Jan. 13-20
St. Louis, Mo.	Jan. 14-20
Cincinnati, Ohio	Jan. 14-20
Philadelphia, Pa.	Jan. 15-20
Brooklyn, N. Y.	Jan. 15-20
Detroit, Mich.	Jan. 20-27
Hartford, Conn.	Jan. 20-27
Baltimore, Md.	Jan. 20-27
Boston, Mass.	Jan. 20-27
San Francisco, Calif.	Jan. 20-27
Montreal	Jan. 20-27
Pittsburgh, Pa.	Jan. 20-27
Montreal, Canada	Jan. 20-27
Rochester, N. Y.	Jan. 22-27
Harrisburg, Penna.	Jan. 24-27
Chicago	Jan. 27-Feb. 3
Washington, D. C.	Jan. 27-Feb. 3
Indianapolis	Feb. 3-9
Toledo, Ohio	Feb. 3-9
Camden, N. J.	Feb. 3-10
Los Angeles	Feb. 3-11

Omaha, Neb.	Feb. 5-9
Lansing, Mich.	Feb. 7-10
Rapid City, S. D.	Feb. 7-10
Springfield, Ill.	Feb. 8-10
Kansas City, Mo.	Feb. 10-17
Syracuse, N. Y.	Feb. 10-17
Black Hills, S. D.	Feb. 15-17
Des Moines, Ia.	Feb. 19-24
Evansville, Ind.	Feb. 20-24
Denver, Colo.	Feb. 20-28
Peoria, Ill.	Feb. 21-25

OTHER SHOWS

Road Show, Chicago	Jan. 22-27
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CONVENTION AND SHOW

Natl. Assoc. of Engine and Boat Mfrs., New York City	Jan. 19-27
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CONVENTIONS

American Road Builders' Association, Chicago	Jan. 22-27
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MEETINGS

S.A.E. Annual Meeting, Detroit	Jan. 22-25
National Automobile Dealers Assoc., Chicago	Jan. 29